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TRANSACTIONS

OF THE

FIFTH ANNUAL MEETING

OF THE

AMERICAN LARYNGOLOGICAL ASSOCIATION

HELD IN THE CITY OF NEW YORK

MAY 21, 22, AND 23

1883

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TRANSACTIONS

OF THE

FIFTH ANNUAL MEETING

OF THE

AMERICAN LARYNGOLOGICAL ASSOCIATION,

HELD IN THE HALL OF THE ACADEMY OF MEDICINE, NEW YORK, MAY 21, 22, AND 23, 1883.

First day, morning session.

The Fifth Annual Congress of the American Laryngological Association was called to order at ten o'clock by George M. Lefferts, M.D., President of the Association.

The Secretary, D. Bryson Delavan, M.D., called the roll, the following Fellows being present during the session:

FELLOWS PRESENT.

Harrison Allen, M.D., Philadelphia.	E. F. Ingals, M.D., Chicago.
Morris J. Asch, M.D., New York.	F. L. Ives, M.D., New York.
F. H. Bosworth, M.D., New York.	W. C. Jarvis, M.D., New York.
S. H. Chapman, M.D., New Haven.	S. Johnston, M.D., Baltimore.
J. Solis-Cohen, M.D., Philadelphia.	R. H. Kealhofer, M.D., St. Louis.
Wm. H. Daly, M.D., Pittsburgh.	F. I. Knight, M.D., Boston.
T. A. DeBlois, M.D., Boston.	S. W. Langmaid, M.D., Boston
D. B. Delavan, M.D., New York.	G. M. Lefferts, M.D., New York.
F. Donaldson, M.D., Baltimore.	R. P. Lincoln, M.D., New York.
J. H. Douglas, M.D., New York.	G. W. Major, M.D., Montreal.
W. F. Duncan, M.D., New York.	E. C. Morgan, M.D., Washington.
L. Elsberg, M.D., New York.	D. N. Rankin, M.D., Allegheny.
T. R. French, M.D., Brooklyn.	Beverley Robinson, M.D., New York.
W. Gleitsman, M.D., New York.	J. O. Roe, M.D., Rochester.
U. G. Hitchcock, M.D., New York.	C. Seiler, M.D., Philadelphia.
E. Holden, M.D., Newark.	A. H. Smith, M.D., New York.
F. H. Hooper, M.D., Boston.	Clinton Wagner, M.D., New York.

The Chairman invited ex-Presidents of the Association to occupy seats upon the platform, and then proceeded to deliver his annual address.

PRESIDENT'S ADDRESS.

Gentlemen :—

Among the manifold duties incident to the Presidential office, none is more grateful, none affords more pleasure, than the one of welcoming each year old friends to our annual gathering.

I greet you, then, colleagues and fellow-workers, with cordiality. I extend to you right heartily the hand of friendship. I welcome you, in my own name and that of your colleagues residing here, to our home. I offer you, as far as lies in my power to do so, unbounded hospitality.

We hail your coming with pleasure ; but after all, are we not already of one brotherhood ? Has not a common bond long ago united us in one family ? Then what more need I say than re-echo the words of Portia :

> " Sir, you are very welcome to our house.
> It must appear in other ways than words,
> Therefore I scant this breathing courtesy."

My next duty, and it is one which I deeply feel, is, before assuming the responsibilities of office, to thank you for the honor you have conferred upon me in electing me to the office of your President, and to assure you that it will be my earnest endeavor to justify your choice, however I may fail to satisfy my own and your expectations.

May I venture to ask at your hands a generous interpretation of my efforts, so to guide your deliberations here, that they may advance the science and practice of the department of medicine, in which we are all enrolled.

Both the sanction of custom and the example of my worthy predecessors in the Presidential chair, have given you the right to expect—nay, to demand from me, an inaugural address. I am fully aware of the obligation ; but, may I be pardoned if I follow my conviction of what is best ; if I overthrow, for the once, a custom sanctioned by long usage ; if I dare to set an example to this Association, which, I venture to hope, may be followed by my successors ?

Why should I, I ask myself, sacrifice time to the delivery of an

address of the usual form, dealing with generalities, filled with recommendations rarely acted upon? why sacrifice to platitude, to words—

> "Words are like leaves, and where they most abound,
> Much fruit of sense beneath is rarely found."

our time, hours already too short, when so much practical work lies ready to our hand and has to be accomplished?

Bear with me, then, when I, instead of a general address, say only a few words; when I offer rather as my contribution to the general work, as my mite, to the store of scientific wealth, which through you, by your efforts and with your aid, has been gathered together—only a paper.

The few moments that I shall occupy cannot better be utilized than in first congratulating you, as I think I ought to do, upon the *status* of our present Congress.

Never before in the history of our association, has our annual gathering been so large. We have with us to-day or will have during the meeting, thirty-seven of our Fellows, among whom are some, and I here welcome them cordially, who have not before met with us. May their example be speedily followed by other erring ones.

Never before has the number of Essays presented been so large.

At our first Congress, they numbered fourteen; at our second only eight; at our third they reached fifteen; at our fourth they reached eleven; and to-day they have swelled to the number of twenty-three, within one of fifty per cent. of our whole membership.

Never before have the subjects chosen covered so wide and varied a ground, or been of as great interest.

Do not these facts speak well for the vigor, for the vitality of our organization? Do they not show an increased and increasing interest in our work, and in each other?

I hold so, and I congratulate you, I say, that it is so, and I congratulate myself, with a just and pardonable pride, that it has been under my leadership that you have so well rallied about me, in my earnest aim to make the present a memorable occasion in our history.

Our constitutional limit is a fellowship of fifty. To-day, after a short life of five years, that limit has been, or will be, in a few moments, reached. Our ranks are full, our number complete. Here again a subject for self-congratulation presents itself.

Success has crowned our efforts to make our young Association a living and lively power among American laryngologists. Of its enviable reputation abroad I do not speak.

But how now are we to provide for the coming man in the latter class? How find room within our gates, formerly open, to-day closed, for those who will, nay, who already stand waiting for entrance.

Must it be by enlarging the number wisely agreed upon by our founders, by changing our Constitution, so as to permit of an increased fellowship? No; I would make an entrance now, more so than ever before, a high honor, a patent of worth, to be eagerly sought for, amid keen competition, by those of a younger medical generation than ourselves, but only when an opportunity through vacancy occurs to be striven for.

Another method suggests itself: I mention it with hesitation and would term it a process of elimination, a lopping away of the useless branches from the parent trunk. We have a few, but a very few, drones in our busy hive of workers. Is it more than fair that they should give place to those who are both anxious and willing to assume their unprofitable fellowship, its duties and responsibilities, and try to cause it to bear good fruit? Such changes can but revivify, can but render the success of the present Congress a harbinger of greater successes yet to come.

Our yearly meeting with its resultant volume of transactions are the visible sign of our growth and importance. Most important, all important, is it, to our welfare. Such gatherings as these, it has been said, with the pleasurable amenities they involve, do much to soften and refine the manners, to quicken the intellect of all concerned, and to remove misconceptions of individual character, which are apt to be engendered by isolation and want of friendly intercourse.

Congresses, such as that at which we are to-day gathered, serve then a great social purpose, apart from the intellectual and scientific aims at which they are more immediately directed.

It is much that they afford an opportunity and a stimulus for intellectual effort, which might otherwise, with man's proverbial procrastination, never be called into action. But in these days of an ever-teeming press and of facilities for the free intercommunication of ideas, this is subordinate to the advantage of personal knowledge of the individual and the living interchange of thought.

Again, our annual reunion may, aside from its social aspects, be regarded as a periodical taking-stock of the gains of science in our department, of improved appliances, of more accurate means of diagnosis, and of more efficient modes of treatment. We seek to assimilate to ourselves whatever is of value in the past or in the present, especially in the realms of our science and art.

The advantages of such a process to us all, more especially to those of us, who, if they have not grown gray in the service, have many years been devoted to it, are self-evident.

We are here then to-day, my colleagues, to give our knowledge freely, and to receive from others as freely the knowledge that they can bestow, and in the giving as well as in the receiving to increase our own store.

Docendo Discimus.

But no less are we here to meet each other socially, to remove in that way all prejudices, to promote kindly feeling, to renew old friendships, and to lay the foundations of new, and by personal intercommunion to knit more closely the bonds of that professional brotherhood, of which we are all so justly proud.

Gentlemen! Fellow-workers! in promoting and accomplishing these good works, I bid you, God-speed.

Paper.

NEW FACTS IN LARYNGOLOGY.

By GEORGE M. LEFFERTS, M.D.

IT is with much hesitation that I venture, in the presence of this audience of experts, to assert that there can be any new, or even fresh, facts in laryngology; but the cases to which I shall, for a few moments, ask your attention, and the subject which, I believe, they illustrate, being to *me* new, I have ventured to hope that it might be so likewise to you, and therefore of general interest. In no event can it be regarded as time-worn. If I am right in my diagnosis, the cases belong to a class of affection which has but comparatively recently been recognized, little written about, and hardly as yet fully understood; it is, therefore, worthy of our earnest attention, and I trust in bringing it before you for the first time, that a discussion may be pro-

voked which will, in a measure at least, dispel the cloud of obscurity which now envelops it. If this be the case, my purpose will have been accomplished, and the existence of what I may fairly, perhaps, claim to be new facts in laryngeal pathology, established.

A gentleman, young, strong, and, as I have assured myself by careful physical examination, free from any abnormality of either heart, lungs, or kidney, is sitting at his dinner-table, surrounded by friends; suddenly he has a slight attack of spasmodic cough, and a second later falls from his chair to the floor, unconscious. Almost immediately he arises, resumes his seat and the conversation at the point where it was interrupted.

Is there any relation between so slight a cause as this cough, and so grave a result as the unconscious fall?

This is not the first attack of this character that my patient has had; several have occurred during the past eight years, and with much greater frequency; so frequent, in fact, that he has retained no recollection of the number; attacks of partial unconsciousness, always preceded by the same paroxysmal attack of coughing, have occurred. They last but a few seconds, are preceded by a blurring of vision, with dizziness or vertigo, and pass away instantly, leaving him clear-headed and bright.

I have said that he is a young and strong man, free from organic lesion. He has an incomplete history of hereditary neurosis. There is no evidence of any convulsive movements during his attack; these latter are always ushered in by the tickling in the larynx and violent cough; the face becomes suffused. In the worst, he falls without cry, but rises almost immediately, without confusion of ideas, and without remembrance of what has occurred during his brief unconscious interval. In the lighter attacks, the premonitory cough is often followed by a few stridulous inspirations and a slight feeling of suffocation; then vertigo and momentary unconsciousness, or, it may be, slight cough alone, with some spasm of the larynx, slight dizziness, but no unconsciousness.

An examination of his larynx shows that, aside from a

slight hyperæmia, the appearances are normal; the pharynx is granular; uvula is not elongated.

Such is the history. Are you ready with a diagnosis? I was not when I first saw the case.

A second instance, of the same affection, I have seen; and the two constitute my experience of it; two only, and these after a number of years' exclusive practice.

It likewise concerns a young, strong man, and his history would be but a repetition of the first that I have detailed to you, with the exception that his attacks are not so severe; he has had but two unconscious falls, and he does not live in dread of sudden accident in the street or elsewhere. He has no history of other neurosis. A sister is decidedly neurotic. The history of his affection dates back one year only.

To those of you who have followed journalistic literature of late, I need not name the affection; you will have recognized my imperfect description of its main features, as exemplified in my cases. The "Laryngeal Vertigo" of Charcot is readily diagnosed, perhaps, provided the given case present the symptoms that I have detailed, and you are aware of the existence of such a disease. Nothing within the range of our specialty can, I believe, be easily confounded with its peculiar manifestations. But the thought suggests itself to me, are these always typical? Will it not be easy to misconstrue other conditions, which will suggest themselves to you, and confound them with this rare disease? Upon this point certainly we need observation and study. Can you, gentlemen, add any thing of value to the question of diagnosis?

Rare the affection is,[1] since Sommerbrodt, in 1876, gave us the account of a case of recurrent loss of consciousness attended by convulsions, which seemed to be due to the presence of an intra-laryngeal tumor; and Charcot, in the same year, detailed to the Société de Biologie two cases, together with the results of his investigations as to their etiology. Few have been added to the list, namely: Gasquet, one in 1878; and Charcot, two more again in 1879.

[1] See Krishaber: *Annales de l' oreille et du larynx*, tome viii, p. 12, 1882.

To these I add one by Grey, one by Krishaber, and the sum total amounts to but eight published instances; ten, if I include my own cases.

We may well be pardoned, then, if we are not, as yet, familiar with the disease; but our very unfamiliarity enhances to us its interest.

One word in regard to etiology, in so far as we, to-day, understand it, and I have finished—and it is to this part of the subject that I would ask your special consideration. Charcot holds, that the origin of the curious symptoms incident to the affection lies in a peculiar irritation of the centripetal laryngeal nerves; that the "laryngeal vertigo" is, in many respects, to be compared with the vertigo met with in "Menière's disease." The accuracy of this comparison is questioned by Grey, in his valuable brochure, to which I am indebted for much information, and whose views I quote, as I believe them to be correct. He holds that the two affections named are in many respects unlike; notably, because in the latter there is generally *only* vertigo, not unconsciousness; in the former, both. He also discards the older term "laryngeal vertigo," and substitutes that of "laryngeal epilepsy," admitting at the same time that the affection differs radically from typical epilepsy, in the important particular of being readily amenable to treatment (the bromides), but believing that the term "vertigo" is a misnomer, for in all of the cases thus far reported consciousness was entirely lost at times, and in many there were convulsive movements. The word epilepsy, then, used in the more catholic sense of implying all sudden actions of nerve-cells, describes the phenomena better than any other.

Is this disease, then, truly a form of epilepsy? To this point, secondly, I would direct the discussion.

To substantiate Grey's view, it should, as he himself says, be proven that the phenomena do not occur except in persons who are either personally or hereditarily epileptic or neurotic. An analysis of the cases thus far known would seem to give an affirmative reply and show that they do not, but the rule is certainly not an invariable one. Our experience is as yet, however, too limited to definitely decide the matter.

Féréol and Jean have shown, in their study of the laryngeal symptoms of locomotor ataxia, that an organic irritation of the laryngeal nerves may cause violent and spasmodic cough. The picture that they draw is a graphic one; but such cases are not necessarily accompanied by loss of consciousness.

Why, asks Grey, was it that these long-standing organic lesions, evoking much more violent spasms of laryngeal muscles than in the instances of the so-called "laryngeal vertigo," did not induce loss of consciousness or convulsive movements?

The temptation is great to assume that it was for want of pre-disposition; and this view seems more probable when it is remembered that an excessive degree of direct violence to a nerve is required in order to produce unconsciousness.

Have I not said enough concerning this rare and curious affection to show, first, what a field for speculation, thought, and investigation lies practically uncultivated before us; and, second, should not this thought stimulate us to undertake the task?

I commend it to you, with confidence.

Discussion on Dr. Lefferts' Paper.

Dr. ELSBERG said that as he was just recovering from a severe illness he felt physically unable to enter upon a discussion of the exceedingly interesting subject brought forward by Dr. Lefferts. He desired simply to state that he did not agree in regarding these cases as either vertigo with Dr. Charcot, or as epilepsy with Dr. Grey; although they simulate both these affections, and certainly imply a neurotic condition of the patient.

Last year at the Congress of this Association, he had referred to four such cases that had come under his own observation, and one described by Dr. Hack. He considered them cases of complete or total spasm of the laryngeal adductor muscles,—that is, spasm of *all* the adductor muscles, and to this completeness is due the brief duration of each attack and the safety of the patient. In incomplete spasm, that is, when not all the adductor muscles are affected, partial respiration but incomplete aëration of the blood may go on and lead to a fatal issue unless tracheotomy be per-

formed ; but the total spasm produces unconsciousness, whereupon the spasm relaxes and the attack is over.

Dr. KNIGHT suggested the theory that the phenomena were due simply to the disturbance of the respiratory function, as supported by the fact, well known, that temporary unconsciousness may be produced by rapid respirations, as in the practice of auscultation ; in fact, anæsthesia for operation was sometimes so produced before the days of chloroform and ether.

Dr. MAJOR remarked that though not prepared to discuss so abstruse a phenomenon as that propounded by Dr. Lefferts on purely scientific grounds, still on general principles he thought it well not to lose sight of the fact that such a condition might probably be considered an epileptic aura. Such peripheral irritation occurred elsewhere, then why not in the larynx? At the same time, he did not seek to diminish the interest of the subject to the pure laryngologist.

Dr. S. JOHNSTON thought the suggestion offered by Dr. Knight a good one, having personally experienced an attack of vertigo from rapid respiration.

Dr. INGALS suggested that the brief and sudden loss of consciousness was similar to that of the pseudo-apoplexy of fatty degeneration of the heart.

Dr. LEFFERTS, in closing the discussion, said that it would seem, from the remarks, that the whole subject is, as he had said, involved in doubt and obscurity. Of course, it is very easy to construct theories to account for the phenomena presented by these patients. He was inclined to believe them due to one of the various auræ of epilepsy, commencing in the larynx. The subject is a comparatively new one in laryngology, and affords a wide field for future investigation and study, which he commended to the further consideration of the Association.

Paper.

A COMMON FORM OF VOCAL DISABILITY RESULTING FROM PATHOLOGICAL PROCESSES. THE PHENOMENA USED TO DEMONSTRATE THE FALSITY OF ONE SYSTEM OF VOICE-TRAINING.

BY S. W. LANGMAID, M.D.

I HAVE been frequently consulted by actors and singers with regard to an affection of the throat, the nature and cause of which they could not understand ; the effect being, however, quite apparent in the resulting vocal disability.

This disability consists in an inability to sing above a certain note of the scale, or, in the case of actors, in the sudden break of the voice at a certain point in the upward inflection.

Usually, the voice, although somewhat altered in quality, is good enough in the conversational register, but above this, at some particular note, no effort is sufficient to make any thing but a feeble sound of the poorest falsetto quality.

The interesting feature for us in these cases is the fact that, the kind of voice being known, the history of the case and the laryngoscopic examination enable one to say at exactly what note the voice will fail, and through what portion of the scale it is possible to use it. This knowledge may be of consequence, inasmuch as a modification of the music to be sung, or a change in inflection in recitation, may sometimes enable the singer or actor to "get through" single performances, if not with credit to himself, with safety to his manager. It will also be of service to the patient if the nature of the disease is explained, because, in the absence of pain or soreness of throat and of any other symptom, a tendency to weakness of voice at a certain place where it is always strong, may warn him to desist from any use of the voice until the disability is removed.

The cause of this affection (I am speaking of skilful actors and singers) is, in most cases, fatigue of the vocal organ by unusual efforts. It may result from too long continued or too forcible use of the voice, with or without some added catarrhal inflammation of the mucous membrane. It not unfrequently results from the sudden resumption of public singing or acting after more or less protracted disuse of the voice, and ordinarily it is the best artists who are the subjects of the affection, because greater efforts are demanded from them than from others. Again, it is the affection peculiar to the most powerful vocal organ; to the voice capable of producing heroic effects. So it is the tragedian or singer of grand opera who is likely to suffer, rather than the comedian or singer of operetta.

As I have said, the history of the case almost always reveals the cause to be unusual vocal effort, or, it may be, that only the ordinary use of the voice has been demanded during great physical prostration or general fatigue of the body.

It may be gradual in its onset, or, as I have known it in two instances, instantaneous in the midst of a performance.

The laryngoscopic appearances are either of slight injection of one or both vocal cords, or none at all. But the position of the cords is that of relaxation, when the note upon which the break occurs is attempted. The glottis fissure may be simply elliptical, or, as more generally occurs, open throughout its whole extent, the vocal processes receding more or less from each other.

The laryngoscopic image need not be further described, because it is the already well-known one of vocal fatigue.

The paresis is of the sphincter muscles of the glottis, including the tensors of the cords.

Both the position of the cords and the musular affections which produce it are clearly described in the admirable work of our esteemed colleague, Dr. Cohen.

The only fact to which I desire to call attention is, that in typical cases, unassociated with any but the slightest injection of the mucous membrane covering the cords, nothing unusual is noticed when the patient is made to sing successively the notes of the scale from below upward until a certain note is reached, and then the change in the position of the cords is well marked, and differs from that which was to be expected. Instead of the progressive closure of the glottis, especially of its posterior portion, a sudden relaxation is seen to take place, the cords receding, the vibrations appearing to be slight, and the resulting tone being without resonance and of falsetto quality. The patient confesses to a sensation of relaxation of vocal tension, and realizes his disease to be what the Italians designate as "*abassamente di voce*," the lowering of the voice.

The degree of the scale upon which this takes place is in soprano and tenor voices, the ninth of the scale in the key of C, or within the limits of a tone above or below that

note. In very high voices it may occur somewhat higher. In contralto and bass voices it occurs at the seventh of the scale. Now this happens to be the precise place in the scale at which the so-called change of register occurs in the normal voice.

Almost all treatises on singing recognize the fact that at a certain note of the scale a change takes place in the method of producing the tone. The so-called break in the voice may in some cases present an almost insuperable barrier to further production of tone, or it may be so slight as not to be recognized by the singer; yet the trained ear will always detect a slight change in the quality of the tone resulting from changes in position of the larynx, in cord tension, and resonance.

As most vocal teachers and treatises on the use of the voice recognize this change, so do they attempt to point out the means of overcoming it when it proves to be an obstacle to the necessary homogeneousness of the singer's scale.

It is not within the scope of this paper to point out the various directions which have been given to overcome this break in the voice. We have to deal with one kind of teaching, the results of which are pathological conditions of the larynx.

I am occasionally consulted by students of vocal music who—soprano, tenor, or bass—find after months or years of study that the voice has become weaker rather than stronger, and that attempts to sing are not only unsatisfactory in an artistic sense but extremely wearisome also.

The teacher complains that the pupil does not make progress, and that the tone has acquired the quality which is termed breathy, and the teacher and pupil becoming discouraged seek for an explanation in the possible existence of some disease of the vocal organs; and not without reason, for a laryngological examination reveals almost the precise condition spoken of above, which it has been said is the result of laryngeal fatigue. Now it will be found that from some preconceived theory, the result frequently of misconception of what has been written about the right way of "forming the voice," or through ignorance of any

method by which a new series of tones can be formed resembling those which the pupil has already at command, an expedient has been adopted which, from the apparent relief which it affords to the throat, has been gratefully accepted by the pupil and hopefully practised.

This method consists in the substitution of the falsetto production of these notes of the scale of which I have spoken, viz: at the ninth for high voices, and the seventh for low ones.

It may be remarked here, that the skilled singer is always sensible of an increase of tension of the laryngeal muscles as the scale is sung upward, but this sensation is a grateful one, and is not attended with the feeling that the organ is being strained unduly, because the compensating necessary changes in laryngeal position and in reflection of tone help to establish a kind of tensive equilibrium.

To give to the pupil who needs it just such a production is one of the functions of the voice-trainer, but, as I have said, the specious error of relaxing tension is the pitfall into which teacher and pupil fall, and the result is as stated above. It should be said that the wrong nomenclature which is used in many treatises on singing, even in those which have the sanction of great artists, is largely responsible for the error, since the term falsetto is used to designate the changed production which it has been said is inevitable at certain notes.

I purposely avoid making any remarks upon the right use of the falsetto voice. I simply say that when used in the place of the proper laryngeal tone the results are disappointing, and may be disastrous.

I am not aware that this disease of the larynx has ever been spoken of as the result of a school of singing, or that the falsity of this kind of voice-production has been demonstrated by the resulting disability of the vocal organ.

The results of such teaching, viz., the resort to the falsetto production at a degree of the scale where sudden changes in tension and reflection of tone are normally called for, so far as examination of the larynx reveals them, are identical with the pathological phenomena caused by fatigue of the vocal muscles from strain of the voice.

The treatment of this condition of paresis of the vocal muscles belongs in part to laryngologists, but mostly to the teacher. The explanation of the pathological condition suggests the remedies both to the physician and teacher.

That the strength of the voice may be restored, and the paresis of the vocal muscles removed, I have reason to know from experiments which I have made with both male and female voices, which had been rendered useless by the wrong method of use. These experiments being undertaken principally for the purpose of proving the theory which was used to account for the laryngeal phenomena.

Discussion on Dr. Langmaid's Paper.

Dr. CARL SEILER said that he had been very much interested in the admirable paper just read ; especially so because he had a case under his care exhibiting the same phenomena. He could not agree with the reader of the paper, that the condition described is due solely to misuse of the voice, although such over-exertion may aid by producing fatigue of the muscles of the larynx. He had noticed in a great many cases a gradual failure of vocal power in singers ; and, finally, an actual break occurs. In such patients he had found, in the great majority of cases, an enlargement of the pharyngeal tonsil, which caused narrowing of the upper air-chambers, and by shutting off, to a certain extent, the nasal chambers, prevented the vibration of the vocal cords from being aided by the vibration of the air contained in these cavities. In the case he had first referred to, the voice has become a great deal stronger, since the removal of an hypertrophied tonsil. The appearances described in the paper were undoubtedly present, but the removal of the tonsil aided in the cure, and the voice improved almost immediately after this obstruction was taken away.

Dr. WM. H. DALY said that two cases had come under his notice within the last three months, illustrating the condition so ably described by Dr. Langmaid. The first was a former patient of Dr. Langmaid's, and was referred back to him for treatment. He was a leading member of an opera company ; he had a well-developed larynx, and there was no abnormality of the nasal chambers, certainly no enlargement of the pharyngeal tonsil. He was a very conscientious singer and his confrère was a very lazy one, so that he was forced to make extra effort in order to sustain his part to

the best of his ability, and sometimes to his own disadvantage. He was suffering very much when he came to Pittsburg, so much so, that he was afraid to undertake his rôle, lest his voice should suddenly fail him on reaching a certain high pitch. After a very careful examination of the case with the laryngoscope, as well as a general examination, an opinion was expressed, that he was suffering from fatigue of the laryngeal muscles, due to overwork, and he was directed to rest his voice for a time by either withdrawing entirely from singing, or by practising the arts resorted to by his colleague.

The next case was that of Miss A., an eminent opera singer, who, while sustaining the leading rôle in an opera in Pittsburg, found her voice suddenly fail her in attempting to carry notes in the upper register, which ordinarily were accomplished without the slightest effort or inconvenience. On being called to see her, she was found in a high state of nervous excitement, incident to the circumstance of the house containing a crowded and expectant audience, awaiting an unfinished rôle by the leading singer. A hasty laryngoscopic examination enabled me to assure her that sufficient relief could shortly be rendered to enable her to continue her part with some degree of satisfaction.

The laryngoscopic inspection had disclosed a patch of our favorite Pittsburg soot, which was dried and fastened upon the right vocal cord, covering about one third of its extent at its anterior end. When this was removed by first moistening it by means of the spray, and then by using a soft cotton brush, a hyperæmic patch was revealed beneath, which readily accounted for the adhesion and drying of the foreign substance upon the cord, and creating a large part, at least, of the disability.

She had been singing for many consecutive nights, and was consequently overworked. After the thickish film of dried soot was removed, she was enabled to proceed with her rôle, but not, however, without the remaining difficulties attending relaxation of the vocal muscles called upon in the formation of the upper notes. She greatly improved under local treatment with as much rest as could be obtained under the pressing circumstances of her position before the public.

Cases of this character require more than local treatment, however, and ergot, nux vomica, and other nerve stimulants will restore normal contractility, and will assist, with rest, in re-establishing a healthy action.

Dr. GEORGE W. MAJOR said that the last patient mentioned by Dr. Daly had also been under his care last spring. She had been very much overworked. A condition resembling paresis of the arytenoid muscle was discovered, with slight hyperæmia. Rest was advised, but the advice was not followed.

In closing the discussion

Dr. LANGMAID said: In reply to Dr. Seiler he would say that it seems not unlikely that the occurrence of an hypertrophied pharyngeal tonsil might easily help to produce such a disturbance in the production of tone, as to lead the singer to adopt some unnatural method of singing which would be likely to produce fatigue of the vocal organ.

He quite agreed with Dr. Daly that treatment by strychnia, galvanism, and other means is to be used in these cases. He had never used ergot.

Since reading the paper he had been informed by Dr. Elsberg that Mandl has written upon the subject. He was quite unaware of this, and would be glad to compare Dr. Mandl's observations with his own.

At the close of the morning session a business meeting was held for the appointment of committees and the election of Fellows.

The President appointed the following:

Nominating Committee.—Drs. Knight, Daly, and Asch.

Auditing Committee.—Drs. S. Johnston and Morgan.

Dr. Hitchcock having been appointed Teller, a ballot was taken, and the following gentlemen, upon the nomination of the Council, were elected active Fellows of the Association:

C. W. Chamberlain, M.D., Hartford, Ct., proposed by Drs. H. A. Johnson and Solis-Cohen. Thesis: "On Some Phases of Laryngeal Syphilis."

John N. Mackenzie, M.D., Baltimore, Md., proposed by Drs. Hartman and S. Johnston. Thesis: "On an Hitherto Undescribed Malformation of the Naso-Pharynx."

A communication was presented from the Philadelphia Laryngological Society, inviting the members of the American Laryngological Association to attend the regular meeting of the Philadelphia Society, upon the evening of May 25th, at the house of Dr. Harrison Allen.

Moved that the invitation be accepted. Carried. The morning session was then adjourned.

quantity of mucin in the meshes of the myxomata, the first effort at evulsion generally produces free discharge of the fluid, with tearing of the polyp. Subsequent attempts remove the walls of the sac with its pedicle composed of connective tissue with the epithelial coverings. Often, repeated efforts are made by torsion with slender, tapering-bladed forceps to remove the ends and points of attachment. If care be taken to sever the pedicle as near as possible to its insertion, this mode of removing polypi is very effective. It is sometimes a matter of difficulty entirely to remove, amid the flow of blood, all traces of the so-called roots in the upper and middle turbinated bones. There is no mode of producing complete local anæsthesia, so far as to prevent the exquisite pain resulting from the operation. We can, however, deaden somewhat the sensibility by using a spray of ice-water containing salt. The advantages of the removal of these neoplasms by evulsion are: its effectiveness, the comparatively short time consumed in the operation, and the frequent non-recurrence of the growth.

Abscission—destruction by simple cutting instruments and forceps containing sharp blades—is seldom attempted. This mode of operation must be supplemented by the use of tearing forceps or the galvanic cautery. Dr. Morell Mackenzie states that he has settled down, generally, to the use of his punch-forceps, resorting afterward to the electric cautery to the base of the growths.

Specialists, now, are more partial to the use of the *snare écraseur*, of the kind proposed by Wilde for the ear, Blake, Jarvis, and Türck. This method of removing nasal polypi is efficient and easily applied, especially when we resort to Dr. Jarvis' finest instruments as modified in shape by Dr. Bosworth.[1] The use of these is attended with much less pain, and when the screw is slowly worked, with but slight loss of blood. If the cold wire can be attached high up the pedicle, the polyp can often be readily removed. It is, however, no easy matter with a snare to get hold of the

[1] Dr. Bosworth had but one recurrence in thirty-five cases treated by the wire écraseur.

insertions of the polyp, hidden away as it often is, no matter how brightly we may illuminate the nares. Our purpose is not only to get the growth safely away, but, if possible, to prevent its return. In our experience, if the snare only is resorted to, the growth very frequently returns.

In cases of frequent recurrence of the polypi, if the growths spring from one of the turbinated bones, Fergusson, Prof. Gross, and Dr. Morell Mackenzie advocate the removal of a portion of the bone. Dr. Mackenzie has a special instrument for this purpose—a fine hollow forceps having toothed edges on one side and smooth edges on the other, whilst between the two, a sharp cutting blade which can be rammed down. With this he easily accomplishes the removal of the portion of the bone affected. Some polypi, from their anatomical situation, can not be removed, he believes, without this operation.

Dr. Mackenzie's view, that no evil results from the removal of pieces of the turbinated bones, is now, we think, amply confirmed by other observers.

Of late, some operators resort frequently to the use of the *electric cautery*, either with wire loops, or with bulb-pointed electrodes. There is less hemorrhage by this method, but if a hot wire be used to remove the points of attachment, the operation is painful. It divides well the point where the wire is drawn around the growth, but we can not, thus easily, remove the insertions. We must burn them out, and in doing so, it is difficult to avoid injuring more of the membrane than we could wish. Even in the hands of the most skilful it often gives rise to local inflammation and does harm.

Different caustics have often been used for the destruction of nasal polypi. Nitric acid, London paste, Vienna paste, acetic acid, and others have been tried. They were found to destroy the polyp in part, but they have been abandoned because, with the neoplasms, they injured the adjacent structures. Their destructive properties were not limited to the growth. Glacial acetic acid, when injected into the polypi, destroys them, but if it touches the mu-

cous membranes, an accident very difficult to avoid, it inflames them, causes great pain, and destroys the healthy structures. If we promptly spray the parts with alkaline solutions, we easily neutralize the acid. Anxious to obtain some powerful caustic, which could be used without the inconveniences attendant upon the employment of strong acetic acid, we commenced using chromic acid in the form of minute crystals, and in a solution of one hundred grains to the ℥. We had for years applied it for the destruction of chronically enlarged faucial tonsils, where we could not, or were not allowed, to remove them by the tonsillitome.

We had found chromic acid a powerful escharotic, not causing pain or hemorrhage, and, when cautiously used, perfectly under control.

Its action is that of a prompt solvent of organic matter. It rapidly oxydizes and decomposes the tissues. It loses one half of its oxygen, and is itself converted into the inert sesquioxide. It is, at the same time, an antiseptic and disinfectant. "It appears," according to Wood and Bache, "to owe its antiseptic action to its power of coagulating albumen and all protean compounds, in which it has been found to exceed all the acids and metallic salts that have been tried, being ten times stronger than carbolic acid, fifteen times stronger than nitric acid, and twenty times stronger than bichloride of mercury." *It gives less pain than other caustics.* It is one of the most powerful destructive agents to inferior organic life, greatly exceeding carbolic acid in this respect. With saturated solutions, made according to the formula of Marshall, of Unity College Hospital (100 grains to ℥ i), its action is prompt and not penetrating; it takes hold at once. The mode by which we apply the chromic acid is, *first*, to moisten the mucous surfaces with the lead lotion, to protect them; *then*, taking the paste of chromic acid with a glass rod, very thin and pointed, to stick it into the centre of the polyp, as far as we can. By turning the rod we wipe off all of the acid in the growth itself. The affinity of the acid for organic matter is such that it acts immediately. The growth crumbles and is removed easily with the forceps. There is no pain resulting,

and no bleeding. The solution is not strong enough, in case of any of the application touching the mucous membrane, to destroy it as an escharotic, or even to blister it, yet there may some irritation result. The use, locally, of the lead lotion, however, protects the contiguous structures. If too much of the chromic acid be applied, we can easily remove it with a piece of soft cotton or lint before it has time to act as an irritant. After the first application, our view of the remaining portion is not obscured by blood. We can touch it, and thus, in a very short time, remove the whole growth.

If we prefer to use the finer snare, after the chromic acid has done its work, and get hold of the base, we can do so with ease and with greater precision. By the application of chromic acid we can touch the exact points of attachment, and prevent the reproduction of the growths, better than by any other process.

This acid can be used efficiently to both varieties of the gelatinous polypi: the simple sarcoma of the submucous tissue, overspread as it is with mucous membranes, with epithelium, and vibratile cilia; and to the adenomatous form.

We have thus destroyed mucous polypi in a number of cases. It has been in our hands an efficient and safe escharotic. It saves time, is effective and painless.

In *fibromata* it is valuable, but not to the same degree, because they extend frequently to a portion of the naso-pharyngeal cavity.

We wish to be distinctly understood that we do not propose the employment of chromic acid, for the destruction of nasal polypi, to the exclusion of the surgical methods. We have found it effective as an aid to them; as facilitating their action in the removal of the growths by destroying the substance of the neoplasm; by making the operations less painful, less bloody, and by supplementing their action in destroying the insertion of the growths, and thus preventing their re-formation.

Discussion on Dr. Donaldson's Paper.

Dr. Wm. C. Jarvis said that a case came recently under his observation which offered an excellent opportunity for the study of

gelatinoid polypi. In this patient a markedly deviated septum had closed the superior meatus of the left nostril, causing a severe hemicrania, worse in damp weather. Believing that the headache was dependent upon the malformation, he removed the deviated tissue and found the roof of the nose occupied by a number of bead-like polypi. He believed his écraseur, by nipping off a piece of the mucous membrane, prevented the return of growths removed by this method.

Chromic acid is desirable to shrivel up young polypi, but the écraseur should be always used for the larger growths.

Dr. SEILER said that he had some remarks to make in regard to the pathology of polypi. He had examined a large number of growths microscopically and had found them to consist of localized hypertrophies of the mucous membrane which had undergone myxomatous degeneration. He had therefore thought that recurrence was not due to regrowth from pedicle, but due to new formation of polypoid growths caused by irritation, and that if all polypi were removed there would be no recurrence. He had found the wire snare of the Jarvis pattern to be superior to chemical escharotics, and he used the galvano-cautery, if necessary, to destroy the stump, as it was less painful and gave rise to less irritation when properly used than any other caustic he had ever employed.

Dr. W. F. DUNCAN said that he had treated a large number of nasal polypi, and, very much to his regret, had noticed a redevelopment of the polypi, under all forms of treatment, except where a part of the underlying turbinated bone had been removed. Chromic acid he had found useful to produce shrinkage of the growths, thus giving more room for the subsequent operation, and also in reducing the danger of bleeding after removal. The point which he especially wished to make is this, that after any operation, except the one mentioned, for the removal of gelatinoid polypi they would be likely to return in the course of four or five years. The only method in which there is no recurrence is that advocated by Morell Mackenzie and Professor Gross, of removing a portion of the turbinated bone with the base of the polypi.

Dr. DALY inquired if the application of the chromic acid and removal of the growth were accomplished at one sitting.

Dr. DONALDSON replied that they were.

Dr. DALY said that this would remove one objection to the treatment. He had no personal experience with the treatment as

advocated by the lecturer, but it had always appeared to him that any treatment except that of prompt removal was a waste of time. He had used chromic acid in fine crystals, applied with a copper curette or spoon to naso-pharyngeal growths, with much satisfaction. He had also used acid nitrate of mercury and glacial acetic acid, and had been much pleased with them. He did not think it makes a great difference which form of caustic is applied—the effect is about the same.

Dr. DONALDSON, in closing the discussion, said that he had used all the other caustics, but infinitely preferred the chromic acid ; it acts more promptly and is more efficient. Ordinarily, he asks the patients to report themselves once or twice afterward, so as to see that the growth has been entirely removed. He did not say that the pedicle of the growth can not be removed with the snare, but merely that the chromic acid was more convenient to use than the snare.

Paper.

CHOREA LARYNGIS.

By FREDERICK I. KNIGHT, M.D.

DR. RADCLIFFE, in "Reynolds' System of Medicine," declares that "the term chorea is of widest and loosest significance, for it is scarcely too much to say that it is made to include every form of disorderly involuntary movement, partial or general, which has not altogether the specific characters of tremor proper, or convulsion proper, or spasm proper."

This will continue to be the case until the pathological condition, which is at the root of these disturbances, shall have been determined. The tendency among modern neurologists is to class chorea with hysteria as a functional neurosis ; and these two diseases are certainly closely allied, often occurring in the same subject, or in the same family.

A typical case of chorea is, indeed, a very different thing from a typical case of hysteria; but, on the other hand, the two conditions are so suggested in some cases, that observers have taken refuge in the double nomenclature of "hysterical chorea." What is true of the whole is true of a part. What is true of general chorea is also true of its local

manifestations, and many cases of local involuntary action, which have been described under one of these heads, might just as properly have been classed under the other.

Prof. Holland, in a clinical lecture on a case of "Choreal Spasm of the Larynx," says: "The functional nervous maladies are all closely allied. Deficient vitality in the nervous apparatus causes an aberration in some of those functions that are said to represent the play of spirit on matter. This vague way of putting it is the best illustration I can give you of our ignorance of the essence of the diseases that are bounded by chorea, with heart-lesion on the one hand, and insanity without anatomical change on the other. Between these two extremes will be found hysteria, hypochondriasis, epilepsy, trance, and numberless derangements that have no name."

The object of this brief paper is to call attention to the different kinds of cases which have been reported as chorea laryngis, and invite discussion upon them. And, in considering these cases, as will be inferred from what I have already said, I do not think it necessary or judicious in our present knowledge to exclude those which give evidence of hysteria, even when the disturbance of the nervous system becomes as profound as in Geissler's and in Holland's cases. Choreic disturbance in the larynx is probably only one of many possible manifestations of the same morbid condition of the nerve centres. We are justified in using the term chorea laryngis when the movements, as seen in the larynx, are choreic. The evidence of general chorea should confirm rather than weaken the diagnosis. The existence of hysteria, or other morbid conditions of the nervous system, which are known to be often the causes of, or associated with, general chorea, should not prevent our applying the term *chorea laryngis* to what we see as such.

Massei, in 1879, doubted the propriety of considering any of these cases as neuroses of motion, and attributed the phenomena to reflex action from hyperæsthesia of the larynx. He contended that Schrötter took the name chorea laryngis from the symptom, instead of from the pathological condition which caused the symptom. This former

mode of nomenclature we deem much safer, not only in regard to the affection under consideration, but also in regard to paralysis of motion, the causes of which are so difficult to locate.

Dr. Lefferts, in the same year, advocated a narrow restriction of the term, throwing out the cases which gave other evidence of the choreic neurosis, the very evidence, it seems to me, which we want to confirm our diagnosis.

In the present modified state of our knowledge of nervous diseases, we see no objection to classifying all cases of irregular involuntary action of the laryngeal muscles as chorea, recognizing the fact, however, that we are simply stating symptomatic manifestations :

We shall find three varieties of cases reported :

1. Those in which not only the adductors of the larynx, but also the expiratory muscles of the chest and abdomen, are affected, producing a barking cough.

This class of cases has long attracted attention, and we find a considerable number of them recorded, both in prelaryngoscopic times and since. Many of them have been reported as "spasmodic cough," "hysterical cough," etc., but many, also, as "chorea laryngis." Since the days of laryngoscopy the term was first employed by Mandl, afterward by Schrötter, Wheeler, Lefferts, *et al.* The group of symptoms in this class, though not constant, is now pretty well recognized.

The affection consists of a cough occurring in paroxysms and accompanied with more or less vocal sound, which is usually described as barking, but which, at times, has a crowing sound, and sometimes approximates a musical quality (Schrötter). It sometimes develops itself quite suddenly in a child who has been apparently in good health, but oftener in one whose nervous system has shown itself to be weak. The tendency to choreic action in the larynx sometimes shows itself long before the condition is established, as in Makka's case, where the boy barked twice in one evening, and not again for six months.

These paroxysms sometimes occur at a particular period of the day (as in the case of Geissler's), but more usually oc-

cur during the whole day with intervals of rest of uniform duration. The phenomena cease during sleep. It usually affects very young subjects, in most cases the patient being between eight and fourteen years of age. Spamer publishes a case of "intermittent snoring respiration" in a child of one and a half years, with general chorea, which he considers due to a participation of the laryngeal muscles in the general muscular disturbance.

Sneezing is a concomitant in some cases. In some the vocal effort is more marked, resulting, as in the case of Wheeler's, in a note sustained throughout a prolonged expiration. In some cases the phenomena are increased by observation, and in some apparently acquired by imitation (Schrötter), as in general chorea. In a case of Voltolini's, there was a strong impulse to cough, but the glottis would not yield to the expiratory effort. The fact that the patient could cough easily when the mirror was in the pharynx, but at no other time, points to the hysterical element in this case.

This peculiar barking cough may occur independently, as it were, in a patient afflicted with another kind of cough. Mandl reports as "une veritable chorêe laryngienne," a case in which a young girl, having bronchitis with nothing peculiar in the cough, was interrupted every four or five minutes by barking, which resounded with great violence. Laryngoscopic examination in these cases shows either no structural change, or only slight congestion of the mucous membrane.

2. Cases in which the muscles of the larynx alone have been affected. The only recorded case which I know of, is that published by me in the first volume of the ARCHIVES OF LARYNGOLOGY, in which the action was confined to the hyo-thyroid muscles.

I will now report the only case yet observed, so far as I am aware, in which there was well-marked chorea of the adductors of the larynx, without any affection of the expiratory muscles, and hence no effort at cough or vocal vibration.

A single woman, forty-two years of age, came to me from the country in January of the present year. She complained of a pe-

culiarity of speech which she had noticed since August or September last. She had never had serious illness, and both looked and was considered the stout one of the family. There had been recently a little irregularity of the catamenia, but there was no marked disturbance in this function. On inspection of the throat I found regular clonic spasms of the levator palati, occurring about 120 in the minute. On inspection of the larynx I found the same clonic spasms of the adductors, occurring synchronously with those of the palate. The vocal cords were driven together with such violence that I could hear them strike, and the patient complained to me of a ticking in the head, which troubled her when she lay down, which I identified as the collision of the cords. The larynx was normal in appearance, and there was no involuntary effort at cough or production of sound. When the patient spoke voluntarily, her speech was peculiar. The quality of the voice was thickened by the constant spasmodic closure of the posterior nares, and there was also a kind of deliberation and tremor in the voice, though no such interruption to the vocal sound as one would expect from such constant opening and shutting of the glottis. A slight movement, apparently communicated from the soft palate, could be seen on either side of the neck, and this, as well as the clicking noise, was said by her sister to continue during sleep.

This is a unique case, so far as I know. I have found no record of a case in which the adductors of the larynx were affected without any affection of the expiratory muscles; none in which the spasm was rhythmical, and none in which it continued during sleep. I have no knowledge either of such spasmodic action of the levator palati. The bilateral nature of the affection points to some central cause. The absence of other signs or symptoms of organic disease would lead me to classify it in the group of functional neuroses. The points of difference between ordinary choreic action and that in this case are: (1) that generally in chorea the movements are exceedingly irregular, yet Profs. Sée and Charcot both recognize a "rhythmical hysterical chorea"; (2) the action in general chorea ceases during sleep, or occurs only to such limited extent as might be accounted for by dreaming.

Whenever my patient fell asleep in the daytime in the

room with her sister, this action continued. At my request her relatives tried repeatedly to enter her room at night, to observe whether it still continued, but their approach always wakened the patient. If the spasms continued during sleep it is certainly marvellous!

The only remedies so far tried in this case have been arsenic and quinine, both of which were given in increasing doses till the physiological action was obtained, without any effect on the spasm.

3. Cases in which the expiratory muscles alone have been affected (improperly reported as chorea laryngis). Chiari publishes, under the head of chorea laryngis, in connection with a case in which the laryngeal adductor muscles were markedly involved, one in which the expiratory muscles alone were affected. A boy, thirteen years old, who was said to have been always very pale, but well, presented himself with panting expirations without the production of sound. This condition had existed four months. In the beginning there were pauses of a quarter of an hour each; afterward there were no pauses, but the panting expirations continued the whole day. Sleep was always sound. There were about fifty such expirations in the minute, which were usually interrupted once or twice by a cough or hack. The panting sound was so feeble that it could only be heard when one was very near. The contraction of the abdominal muscles with every expiration could be felt. The laryngoscope showed only slight redness of the trachea, and the glottis was seen to remain open during these frequent expiratory acts. There were no choreic movements of other muscles.

I will only allude to other topics necessarily suggested in this connection, viz., the prognosis and treatment of chorea laryngis. If we take note simply of the form of perverted motion, without regard to its cause, as it seems necessary to do in the present limited state of our knowledge of the essential nature of such affections, diagnosis is not difficult. If we attempt refinement without sufficient groundwork to build on, our task will be very great. Simulation is not to be thought of in most cases. The incessant activity is

usually evidently as annoying to the patient himself as to his neighbors.

The cases so far reported, as a rule, seem to warrant a favorable prognosis. Türk and Massei take a less favorable view of it than other observers. The most successful modes of treatment have been those which one would naturally expect to be of service in patients of such diathesis, viz., quinine, the constant current, iron, and cold showers administered to the patient while standing in a warm bath.

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Discussion on Dr. Knight's Paper.

Dr. MORGAN stated that he had been particularly interested in Dr. Knight's paper ; as he had an obstinate case of chorea laryngis associated with spasm of the expiratory muscles, occurring in a girl ten years of age. There was a barking or crowing cough every five or ten minutes, as also irregular movements of the arm. This cough was absent during sleep. Articulation was perfect, and general health good. The treatment employed, which had been partially successful, was Fowler's solution of arsenic. Galvanism, tonics, etc., had failed to relieve.

Dr. LANGMAID said that by Dr Knight's kindness he was given the opportunity to see this case. He was struck by the noiseless rhythmic movements of the palate and of the laryngeal muscles.

It would seem as if no remedies could be of service if medicine proved useless.

In connection with Dr. Morgan's case, he said that in a similar one, which had already been reported in the proceedings of the Society for Medical Improvement in Boston, it was found that the explosion of sound was always preceded by a slight opening of the mouth. The patient was taught to close the mouth in time to prevent the explosion, and this proved to be completely curative.

Dr. INGALS said that he had some years ago seen a patient who presented some of the symptoms mentioned in the paper. There was no spasm of the vocal cords, but there was rhythmic contraction of the levator palati, with synchronic clicking sounds, which appeared to be due in some way to the action of this muscle on the orifice of the Eustachian tube. The patient had been sent to him by Prof. E. L. Holmes, of Chicago, on account of the peculiar clicking sounds, and had returned to the latter for treatment. The result was unknown.

Dr. SMITH referred to a case of spasmodic contraction of the diaphragm, lasting several weeks, which he referred to the same cause although affecting a different set of nerves.

Dr. KNIGHT asked if any Fellow had seen a case reported elsewhere of spasmodic closure of the glottis, as he had not been able to find a case similar to his own in medical literature. He was very glad to hear of Dr. Ingals' case.

Paper.

THE HEALING OF ULCERS IN LARYNGEAL PHTHISIS.

BY WM. C. JARVIS, M.D.

THE cure of phthisical ulcers in the larynx is still doubted by many, and there is much disagreement on the question of their treatment.

The difference of opinion held by eminent authorities, concerning the nature of these ulcers, may have helped to encourage a natural disinclination to be convinced of their cure. Conscious of this popular prejudice, I would have hesitated to present my case and views did I not feel that the evidence of others, the clear history, lesions, symptoms, and remarkable results, completely confirmed my claims.

Miss Coyard, aged forty-five, consulted me on May 22, 1882.

In the preceding February she had been confined to bed with what her physician called the pleurisy. Several weeks afterward, during convalescence, she experienced pain in the throat. The medicine prescribed could not be swallowed without severe pain, and was therefore abandoned. She consulted a well-known specialist, who, upon being interrogated by the patient's aunt, pronounced the disease consumption of the throat and incurable. The inquisitive lady promptly fainted, and was only restored to consciousness to be confined to her bed. I learned this physician's diagnosis several months after the patient called. Her appearance when first seen by me was extremely pitiful. Pale, emaciated, and, peculiar to phthisis, the general signs were distinct from the beginning. Though anxious to speak, her hoarse whisper was soon silenced by suffering. A painful cough racked her unsteady nerves. Accumulations of mucus irritated the windpipe and renewed the paroxysms. Swallowing was almost impossible. Even liquids produced pain in deglutition. She was anxious to finish her meagre meal, and contemplated with horror the return of another. Words, she said, could not describe her suffering.

A laryngoscopic examination showed the laryngeal mucous membrane to be anæmic and irregular. Two pale, puffy projections over the arytenoid prominences gave the characteristic appearance of the pyriform tumefaction in laryngeal phthisis. The mucous membrane over one arytenoid was slightly abraded. The ventricular bands and vocal cords were thickened, and the lumen of the larynx was narrowed by the general tumefaction. A pale, irregular grayish ulcer had eroded the margin of the right vocal cord. All the structures were smeared with sticky muco-purulent discharges. A careful examination of the lungs, made by Dr. W. H. Snow, revealed consolidation of the apex of the right lung, localized softening at the apex of the left lung, old pleuritic friction sound, and cog-wheel respiration throughout both lungs.

My opinion being demanded on the question of a cure, I, from past experience, could only answer in the negative. I promised relief, and no more.

My local treatment was in many respects similar to the mild methods proposed by Dr. Bosworth. I was convinced that the parts would not tolerate the slightest irritation,

and that local anæsthesia was necessary to relieve the tortured larynx. Acrid muco-purulent accumulations were carefully removed by means of alkaline sprays. Spraying was stopped when coughing seemed imminent or occurred. The cleansed structures were then bathed in a spray of Magendie's solution of morphia. Pulverized iodoform was finally thrown upon the part by means of a home-made powder-blower, working on the Ely principle. No tannic acid, acacia, morphia, or other substances were added to the iodoform.

Persuaded by experiment that iodoform is the only powder that can be comfortably borne by the nasal mucous membrane, I used it pure in the larynx. Applications were made every day.

Constitutional treatment was considered almost as necessary as local. A harassing nervous erethism was quieted by the administration of the bromides. Continued doses of the United States solution of morphia prevented the painful cough.

Relief, slow at first, steadily increased under the local treatment and artificially acquired rest. Advantage was taken of the increased toleration of the larynx, to administer a very palatable emulsion of cod-liver oil, pepsin, and pancreatin. The continuation of her method of communicating by writing, which she had been compelled to adopt before seeing me, was insisted upon. Though averse to eating, she craved the crushed strawberry, and soon succeded in eating one with but little discomfort. Thus encouraged, she drank and enjoyed light wines.

I was compelled to leave the city at this stage of her improvement. She was advised to provide herself with medicine and spend the summer in the country. I feared the ground gained would be lost by the interruption of local treatment.

She went to the Catskill Mountains. Several months passed, and the patient, not appearing, was given up for dead.

In the early part of last January, she surprised me by a call.

Her changed appearance prevented immediate recognition. The hollowed cheeks were replaced by a full face, and the painful whisper by a distinct voice. She said outdoor life soon improved her appetite. She ate heartily, relished her meals, and steadily gained in weight.

I examined the larynx, and found an irregular crescentic excavation on the right vocal cord, composed of smooth cicatricial tissue. The lumen of the larynx was still small, and the arytenoid prominences large and smooth.

Although the laryngeal structures were distorted, they were clean and compact. Phonation and respiration showed free movement of the cords. The voice was low-pitched and sometimes rough. This was evidently due to deficient vibration of the eroded cord. The patient pronounced herself well, and was making arrangements to return to Europe. Dr. Alfred Loomis discovered signs of fibrous phthisis.

Conclusions.

A case of this kind, carefully studied, naturally suggests many thoughts.

The appearance and progress of the ulcer exclude the probability of its being tuberculous. Tuberculous ulcers, as a rule, do not commence at the true cord's edges and eat their way outward.[1] The existence of the ulcer may be inferentially accounted for by observing the production and course of superficial sores in the mouth. I have learned from personal experience that, at certain times, one may with impunity lacerate the buccal mucous membrane and expect the torn tissues to quickly heal. The same amount of injury, however, may at another time result in a protracted superficial sore, though the health is apparently unimpaired. Perversion of the buccal secretions invariably preceded or existed with the last-mentioned wound. If covered with shellac varnish, or a metal albuminate, they rapidly healed under the protective pellicle. They also repaired slowly if treated locally with iodoform. When located upon a portion of the mouth in frequent motion, as the palatine folds, and left untreated, they degenerated into

[1] M. Mackenzie: "Diseases of the Throat and Nose," 1880, p. 360.

painful superficial ulcers, causing much discomfort in deglutition, an annoying nervous erethism, headache, and general debility. There is but little wanting, besides the degree, to create an analogy between this lesion with its peculiar symptoms and the condition of the phthisical patient.

As the lesion upon the palatine fold was caused by direct injury, and similar lesions cannot occur spontaneously, so we infer that the ulcer in the phthisical patient originated from an injury. It may have been produced by a cough, or any violence of a similar nature applied to the friable and infiltrated laryngeal tissues. Acrid discharges and constant motion more than meet the analogy and complete the result.

Although the above history does not warrant the physician in extending hope to the majority of patients suffering with phthisical ulceration of the larynx, it demonstrates the curability of certain forms found in this disease. The dependence of the reparative power of ulcers upon depth, as shown in superficial and deep syphilitic lesions, is rendered as proportionately greater in phthisical ulcers as the pain, poor nutrition, and lowered vitality exceed that of syphilis. To expect good results where extensive phthisical erosions involve the laryngeal skeleton, is to over-estimate human endurance.

I have not considered many points of interest, and have intentionally omitted to compare and temper my views, since, to do so, would require more time than the occasion affords.

Paper.

TREATMENT OF LARYNGEAL PHTHISIS.

By E. FLETCHER INGALS, M.D.

SEVERAL papers upon the subject of laryngeal phthisis have at former sessions been presented to this Association, in which the etiology, anatomical appearances, pathology, diagnosis, and prognosis have been so thoroughly discussed, that I may be excused for passing at once to the more changeable and interesting part of the subject, embraced under the head of treatment.

I take up the subject, not with the expectation of completing it, but with the hope of exciting a discussion which may reveal what our science can do at the present day for the mitigation of this dolorous malady.

As it appears to me, three prominent indications are to be met in the treatment:

First: To relieve pain.

Second: If possible to cure the disease.

Third: Failing in this, to so modify the course of the affection as to prolong the patient's life.

Can we meet these indications? Yes. Pain may generally be relieved by topical applications, even though internal medication is of little avail. The second object may sometimes be accomplished by combined topical and internal medication, and in some cases by either of these alone. Lastly, if we do not succeed in curing the disease, in most cases we may at least prolong life.

I have selected from my notes the histories of two cases to illustrate each of these propositions. The cases themselves present no striking peculiarities, and are not materially different from others which have been under my care.

The three objects of treatment I have arranged in what appears to me the order of their importance, but it will be more convenient to change the order in presenting cases.

First: I will present sketches of two cases in which the second indication was fully accomplished, and afterward I will present two histories in which the first, and two in which the third, indications were more or less completely met. The last two will also illustrate the effects of a mode of treatment I have recently adopted which bids fair to be of considerable service.

Case 1.—The following case first came under my observation in February, 1880.

Dr. J. C. G., aged twenty-three, a man of not very robust constitution, had been exposed to cold twelve weeks previously, which was followed by the symptoms of an ordinary subacute bronchitis; subsequently there had been some improvement, but he had never since been quite well. He had lost flesh, was quite anæmic, and

his general appearance was bad. I learned that his mother died of consumption. I found the pharynx relaxed and the larynx anæmic. There was a small superficial ulcer near the posterior end of the right vocal cord.

Upon examining the chest I found slight dulness, subcrepitant râles, slightly prolonged expiration, and exaggerated vocal resonance and fremitus over the left apex, as low as the fourth rib.

I prescribed the chloride of calcium with cod-liver oil, extract of malt and whiskey, and recommended a change of climate. Mildly astringent sprays were ordered for topical application.

The patient went South, where he improved for four or five weeks, but he returned in two months, on account of the bad weather and an attack of circumscribed pleurisy.

I found the ulcer on the vocal cord still present, with slight thickening about it, but the cords themselves were clear. The pulmonary signs were much the same, excepting that there were no râles. His temperature was $100\frac{1}{5}^{\circ}$, cough less and appetite fair.

I ordered a continuance of the same treatment, and sent him to Colorado Springs, where he gained seven pounds in six weeks.

I saw the patient again fifteen months later, when the pulmonary signs had much improved, and the ulcer was found to have healed.

But I saw him eleven months later, when the signs of pulmonary disease were much more extensive, and there was a small ulcer at the seat of the former ulceration.

He spent the following winter in California, and I have not seen him for about eight months, but at the last account he complained of no laryngeal trouble, though I judged that the pulmonary disease had advanced.

Case 2.—W. B., aged thirty-five, printer ; no relation except a cousin had ever had consumption.

He had never been sick, but had always been delicate. There was some reason to suspect hereditary syphilis, but there was no acquired taint. He had lost considerable flesh, but his strength was about normal.

He was troubled with a slight hacking cough, which had lasted two or three years, but he expectorated only a small quantity of muco-pus. Temperature and pulse normal, voice hoarse at times, appetite good, bowels regular, urine natural.

Examination of the larynx showed the left half of the epiglottis

swollen, with an oval ulcer on its upper surface, about six millimetres in length by three in width and two in depth.

Chest.—There was slight dulness with prolonged expiratory murmur on the left side, in front, as low as the fourth rib.

I ordered for him the chloride of calcium and cod-liver oil with alcoholics freely, and applied stimulating pigments to the epiglottis.

The topical applications, which were made about once a week, were changed from time to time, during the first six weeks; afterward I used only iodoform in powder. The general treatment was continued, and at the end of twelve weeks he had gained nine pounds and felt much stronger.

The ulcer gradually healed while his general health was improving, but not at other times; by the end of the third month it was perfectly well, and it has never returned. The swelling of the epiglottis has nearly disappeared.

In the first of these cases, both of which recovered from the local lesions, there was the characteristic superficial ulcer of phthisis, with decided pulmonary lesions, though without the peculiar pyriform swelling of the arytenoids which we often observe. The local treatment was mildly astringent and had to be left to the patient, by whom it was very imperfectly applied; therefore, I question whether it was an important factor in the recovery.

In the second case the epiglottis was swollen and ulcerated. It was treated with occasional applications of a solution of morphia, carbolic acid, and tannin; and, for a time, by regular applications of iodoform.

In both cases the internal remedies consisted mainly of the chloride of calcium with cod-liver oil or maltine and alcoholics; but in one, evidently the most important factor in the treatment was removal to the invigorating atmosphere of Colorado, while in the other there was nothing in the surroundings particularly conducive to recovery.

The only common features in the treatment of the two cases were the ingestion of chloride of calcium and alcoholics, and the use of mildly stimulating and antiseptic topical applications, but both show that laryngeal phthisis may be cured when the pulmonary complications in the case are improving.

Case 3.—C. F. F., aged twenty-three, tailor's cutter. He had been sick for fourteen months, and gave an hereditary history of consumption.

The right wall of the larynx was swollen to about twice its normal thickness. The left wall was less swollen. There was superficial ulceration of the right ventricular band, and the organ was bathed in its secretions.

Physical exploration of the chest revealed dulness, feeble respiration, subcrepitant rales, and exaggerated vocal resonance over the right lung, as low as the sixth rib. There was also some consolidation of the left apex.

I applied to the larynx with a brush, a pigment composed of morphia grs. iv, carbolic acid[1] and tannin, of each, grs. xxx, to four drachms each of glycerine and water.

This application caused considerable smarting, which, however, only lasted a few moments, and then the pain in swallowing, of which he had complained, was almost completely relieved.

At first I used the pigment with him in a diluted form, but subsequently in full strength.

The pulmonary disease rapidly progressed, and the patient died about two months and a half from the time I first saw him.

This case illustrates the relief which may be given in the later stages of the malady by topical applications.

The treatment was only given at irregular intervals, but it was always followed by decided relief from pain, which induced the patient to beg for it even after he knew that he could only live a few days.

Case 4.—J. G., aged twenty-eight, butcher.

The patient came to me complaining of a cough and a pain in swallowing. The cough had existed for about two years. He was somewhat emaciated, but was able to attend to his business.

Upon examination of the chest I found slight consolidation of the apex of the left lung.

[1] Dr. Glasgow's experiments with carbolic acid as a local anæsthetic first induced me to use it for this purpose in the larynx. Subsequently, I added a little morphia for the sake of increasing its efficiency, and later, having occasion to use tannic acid in a case where I was already using the carbolic acid, I put it in the same solution.

Frequent use of this combination led me to believe that the tannic acid prolonged the sedative effects of the carbolic acid; therefore, I have since used the combination as just given.

(This pigment will be referred to in the following pages either as the solution of morphia, carbolic acid, and tannin, or as the sedative solution.)

Examination of the larynx revealed a large ulcer involving and extending above the left ventricular band. The ulcer was single, and about two and one half centimetres in length, by one and a half centimetres in breadth, at its widest part. There was no pyriform swelling of the supra-arytenoid tissues, but the symptoms and the physical signs left no doubt as to the phthisical origin of the ulcer.

To relieve the pain in this case, I applied with a brush the solution of morphia, carbolic acid, and tannin, and from time to time stimulating solutions of sulphate and chloride of zinc.

At the same time the patient was given chloride of calcium, tincture of the chloride of iron, bitter tonics, and alcoholic stimulants.

For about five weeks he gradually improved in strength, and during this time nearly one half of the ulcer had healed.

But then his appetite failed, the stomach became unable to tolerate medicine, the healing process stopped, and deglutition became so painful that he could not eat excepting after the application of the sedative solution already referred to, when he was enabled to swallow comfortably and would eat heartily.

The anæsthesia of the larynx would continue in this case for from twelve to forty hours after the sedative application.

From the time the stomach became disordered, the disease in the lungs rapidly advanced, and the condition of the larynx became worse.

At the time of his death, about two months later, there was extensive disease in the left lung.

In this case I was enabled to accomplish the first object of treatment, and I have no doubt that the relief of pain, by allowing the ingestion of food, added several weeks to the patient's life.

At first topical applications seemed to promote the healing process, but this only continued while the general nutrition remained fairly good.

Case 5.—Mrs. J. E., aged thirty-nine. I saw the patient first February 6, 1883, when I obtained the following history. She stated that last July she had rheumatic pleurisy, upon recovering from which she first noticed a peculiar pricking sensation at the base of the tongue, and occasional pain in the ears.

About four years previously, she had some pulmonary trouble, and about sixteen months ago, she had a slight hemorrhage, but otherwise she had always been well.

Her appetite and strength were fair, but she was failing from loss of rest, caused by the tickling in her throat, and cough, which often kept her awake most of the night. She was subject to frequent attacks of dyspepsia. Some relief from the tickling had been obtained by the use of opiates, but this increased her digestive disturbance. She experienced considerable trouble in respiration, particularly when dyspeptic, but she had but little dyspnœa at other times. She had a hacking cough, and expectorated simply mucus

I found the epiglottis slightly thickened, with a large ulcer on its lower surface.

The lower part of the left ventricular band stood out sharply over the cord, and above it the whole left side of the larynx was occupied by a large grayish ulcer continuous with that on the epiglottis.

Examination of the chest revealed slight dulness over the very apex of the left lung, and exaggerated vocal resonance as low as the second rib, with a few fine mucous rales.

I applied locally a powder of equal parts of iodoform and boracic acid, and followed it by the pigment of morphia, tannin, and carbolic acid ; and I gave her for a home spray a solution of carbolic acid and sulphate of zinc, of each gr. ij to the ounce of water.

The iodoform and boracic acid and the sedative pigment were applied nearly every day for about two weeks. This relieved her cough, but had little or no effect on the ulcer.

Iodide of potassium in full doses was also administered, but with no good result. I also gave her for home use a spray of a solution of the bichloride of mercury, $\frac{1}{16}$ of a grain to the ounce, but it was abandoned on account of the pain which it caused.

After using the iodide of potassium about two weeks I gave her in its stead ten grains of the chloride of calcium in syrup of sarsaparilla, to be taken with cod-liver oil after each meal. She could not take alcoholics.

On this treatment her general condition began to improve.

At the end of four weeks, during which time iodoform or iodoform and boracic acid had been applied almost daily to the ulcer with occasional trials of the nitrate of silver and the regular application

of a small quantity of the solution of morphia, carbolic acid, and tannin, either by spray or brush, I could see no perceptible change in the appearance of the ulcer, though there was less swelling of the epiglottis and her cough was much better.

Having had most excellent results in the treatment of erosions of the nostrils from the topical applications of the volatile essence of eucalyptus globulus, (which is also known as eucalyptol) I determined to try this remedy in the larynx, notwithstanding its pungency.

Upon applying it on a pledget of absorbent cotton to the ulcer, I found that it caused only slight smarting, but severe choking; however, the latter soon passed off, and the smarting was at once relieved by a spray of the sedative solution. This was followed each time by iodoform or iodoform and boracic acid.

This treatment was continued daily with such good results that at the end of a week the ulcer on the under surface of the epiglottis was healing at its edges and appeared improved over its whole surface. At the end of three weeks the ulcer was still healing, and the patient's general condition was so much improved that she was able to walk two miles with but little fatigue. She then had an acute attack of indigestion which stopped further improvement for about a week. Subsequently she improved, and at the date of this writing is doing fairly well.

In this case, there was a single large ulcer with no swelling of the ary-epiglottic folds, yet the symptoms, signs, and history, with the absence of even the slightest proof of former scrofulous or syphilitic taint rendered the diagnosis sufficiently certain.

The morphia, carbolic acid, and tannin speedily relieved her cough, but solutions of nitrate of silver, chloride or sulphate of zinc, and sulphate of copper, associated with the insufflation of iodoform, or iodoform and boracic acid, had no effect in stimulating the healing process in the ulcer; though, as a consequence of the relief from cough, combined with the good effects of internal treatment, her general condition greatly improved.

Case 6.—C. F., aged thirty-three, clerk. The patient came to me last February, stating that in January, 1882, he had pleurisy, and during the course of the disease had suffered from an inflam-

mation at the base of the tongue, which was accompanied by considerable pain, that soon extended to the left ear. About two months later he consulted a physician, who injected something into the larynx with a syringe, from which he became permanently hoarse. Shortly afterward he went to Colorado, where he remained two months. After his return, in the early part of June, he consulted a physician, who gave him tonics and inhalations twice a week, which treatment was continued six months. Afterward, until the time I saw him, he had used a steam atomizer with carbolic acid, tannin, sulphate of zinc, etc., and had taken various nostrums, without improvement.

The patient informed me that his ancestors had been long-lived, and I could discover no hereditary predisposition to disease. Previous to this attack he had not been sick for twenty years. Since the beginning of this attack he had failed greatly in weight and strength, and he had recently been troubled with cough, night-sweats, and dyspnœa on slight exertion.

His pulse was 120; temperature, $100\frac{1}{2}^{\circ}$ F.; appetite poor and digestion imperfect.

The chest was narrow and flat, but there were no signs of pulmonary disease, excepting a slight diminution of resonance over the apices of both lungs, and some harshness of the respiratory murmur.

I found the uvula slightly elongated, pharynx moderately relaxed, and glands at the base of the tongue a little enlarged, but no anæmia of the parts. The epiglottis was slightly thickened, and upon its surface were several small yellowish-white patches resembling the early stages of herpetic eruptions. The ary-epiglottic folds were swollen. There was extensive superficial ulceration of the ventricular bands, vocal cords, and posterior commissure.

The patient was given the chloride of calcium, tincture of the chloride of iron, and cod-liver oil, and alcoholics freely. I applied to the larynx the solution of morphia, tannin, and carbolic acid, following it by a powder of equal parts of iodoform and boracic acid.

At the end of six weeks the patient had very decidedly improved in his general condition. There was less cough, much less dyspnœa, and the swelling of the larynx had considerably subsided; but there was still considerable expectoration, the ulcers showed no signs of healing, and the yellowish patches

remained the same on the epiglottis. I then began the use of eucalyptol.

Four or five days after the first application it was noted that very decided improvement had taken place in the superficial ulcers, and the patient reported that he was resting better than he had been for many months. The muco-purulent expectoration was also much diminished. The patient is still improving.

In this case topical applications speedily relieved the cough and his general condition improved, but no improvement in the ulcers could be discovered until I used the eucalyptol.

I do not dare to hope for complete recovery in either of the preceding cases, but so far the eucalyptol has been more beneficial than other topical applications.

In these cases the constitutional treatment had been much the same before they came under my care as afterward, and as the ulcers were not healing before the topical applications were made, it seems fair to give the local remedies the credit; but we cannot be certain whether the improvement was due to the alterative or stimulating effects of any particular local remedy, or whether it was mainly due to the rest afforded by the relief from cough.

In case 5 the cough had been relieved long before the eucalyptol was applied, though there had been no perceptible change in the surface of the ulcer, and in case 6 the improvement was very much more rapid under the use of this remedy; therefore, although we cannot properly base an opinion of its value on these cases we may at least be encouraged to give it a thorough trial.

In most cases of laryngeal phthisis I have used iodoform persistently; but it has given little, if any, relief from pain, and when used alone it has entirely failed to produce perceptible curative results; therefore, I fear it is of little value for this purpose.

In conclusion, I think it is well established:

First. That we may meet the first indication for treatment better by topical applications than by other means, and we may confidently expect to give our patients great relief for a considerable length of time.

Second. A limited number of cases of laryngeal phthisis may be cured by local and general treatment, and the former is an important factor in obtaining this result.

Third. In many, even of the fatal cases, life may be prolonged for several weeks by topical applications which obtund the sensibility of the part, so as to spare the patient the exhaustion incident to pain and the irritating cough, and at the same time allow the ingestion of food.

Discussion on the Papers of Drs. Jarvis and Ingals.

Dr. S. JOHNSTON referred to a case of laryngeal phthisis, and the only one which had come under his observation, where a cure had been effected. A lady consulted him some years since, complaining of a chronic cough. Laryngoscopic examination revealed an infiltrated epiglottis with its under-surface studded with puncta, which subsequently coalesced, forming a round ulcer. Physical examination revealed no signs of phthisis.

A spray of sulphate of zinc gr. 1, acid carbolic grs. 3, in solution, was used ; and internally a mixture of hypophosphites of lime and soda with glycerine and infusion of cascarilla. There was no application of powders or pigments. In three weeks the ulcer was healed. The patient recently died of diphtheria, and this disease manifested itself especially upon the surface which had been attacked some years before and which had healed.

Dr. DONALDSON stated that he thought persons suffering from laryngeal phthisis could be relieved by local treatment, astringent combined with sedative sprays, powders of iodoform, and antiseptic inhalations, combined with the general treatment. In case deglutition is painful, the patient should be sustained by the injection of food through small œsophageal tubes. He spoke of a case where he had fed a patient daily in this manner for six weeks. The case apparently recovered, and two years afterward was alive.

Dr. BOSWORTH said it seemed to him that, in the whole question of the treatment of laryngeal phthisis, there is the element of doubt of the correctness of diagnosis. What constitutes laryngeal phthisis ; and are not many cases of this disease reported which are nothing more than superficial erosions of the laryngeal membranes ? He wished there were some way in which the matter could be decided. In his own view, there was but one morbid process in the larynx which constitutes this disease. This process

manifests itself in every case in virtually the same way, and runs the same course. It is manifested in three stages: first, the stage of inflammatory thickening occurring in the large majority of cases in the arytenoid cartilages. It constitutes what is generally called the club-shaped arytenoids. This same inflammatory swelling may, however, make its appearance on the epiglottis, where from its location it becomes an exceedingly grave matter, constituting what is called the epiglottic form of the disease. In a certain proportion of cases this swelling develops on the ventricular bands, but never, he thinks, on the vocal cords. In this stage of the disease tubercle is not present, as has been so conclusively shown by Dr. Cohen. In this stage, then, he thought, there should be no question as to the curability of the disease, for he certainly found in his own experience that a cure might almost be promised. The second stage is marked by the development in the swollen membrane of small rounded gray spots, apparently just beneath the surface. They are easily seen on inspection dotting over the surface. If tubercle is ever inspected by the naked eye, these spots are tubercle. The speaker had studied this process on the tongue, and had observed the evolution of these little masses. He had seen them break down and develop into small points of ulceration, which constitute the third stage. These points extend their borders and then develop the true tubercular ulcer. Now this tubercular ulcer is unmistakable. It is a wasting process superimposed upon the interstitial growth, so that we have the apparent incongruity of an ulcer resulting in a greater bulk than the original contour of the part. The surface of the ulcer is coated with ropy mucus, never with pus. All cases of this disease which have come under his notice conform to this course. As to the treatment, some years ago he had written on this subject. He insisted then that no application should ever be made which gave pain. Further, the best promise for these cases was to carry out the following: first, cleanse the part with alkaline spray; second, apply morphine to relieve pain; third, apply iodoform as a specific in controlling ulcerative processes. By this plan he has seen a number of cases recover, and he believes as the result of treatment. The above plan is to be carried out every day.

Dr. SOLIS-COHEN had reached the room so late that he had heard the last sentences only, and was, therefore, unfamiliar with the train of thought taken in the paper, and hardly prepared to join

in its discussion. In reply to a direct question from the President, he stated that in his own experience recoveries from laryngeal phthisis were exceedingly rare, and these cases could not be recognized beforehand. His own view was, that so many cases of tuberculosis of the larynx indicated so many funerals.

Dr. KNIGHT said that he regarded the laryngeal complication a very unfavorable one in pulmonary phthisis. Although an arrest of the laryngeal disease and relief of the local symptoms may occur, the patient goes down hill from the advance of the disease in other organs. Mild treatment, principally cleansing the parts, undoubtedly did oftentimes great service, in relief to the patient and in facilitating the arrest of the local disease.

Dr. ASCH said that his results unfortunately had been the same as those of most of the speakers, and it would afford him great pleasure if there could be discovered a specific treatment for this most unfortunate disease. He feared it had not yet come to light. He had had some cases of extensive pulmonary trouble, in which the laryngeal ulcers were cured, but in each of these there had been some specific trouble, hereditary or acquired, which accounted for the fact.

Dr. LINCOLN said he desired to make a suggestion in regard to the indications for the use of iodoform in cases of laryngeal phthisis which may serve to explain the different opinions entertained as to its utility, and especially the discouraging opinion held by Dr. Ingals as to its advantages. Some ten years ago he published a series of cases illustrating the utility of applications of iodoform in powder or spray (ethereal solution). He believed that he had then stated, that in cases of laryngeal phthisis, iodoform was chiefly useful where there was a solution of continuity, *i. e.*, where there was ulceration, and not where there was a hyperplasia with engorgement of the blood-vessels and dryness of the mucous membrane. He would further suggest as an addition to the mild and sedative spray of carbolic acid, tannin, or solution of morphine, the addition of a few drops of essence of peppermint, two to four drops to the ounce of solution. The constant and universal testimony of his patients as to the comfort derived from the use of this medicament is most gratifying, and leaves no doubt as to its usefulness.

Dr. MAJOR stated, that if laryngeal phthisis is truly a local tubercular development, it is the result of a tubercular condition of the system. If an indolent ulceration occurring in the

tubercular subject, it is the result of systemic depravity arising therefrom. He did not desire to underrate the value of local treatment, but it seemed reasonable to suppose that, under any circumstances, whatever would improve the general health and check the development of pulmonary phthisis would also have the same influence on the presence of tubercle occurring in the larynx. It was generally conceded that a certain pressure and moisture of atmosphere was necessary to develop tubercle. Now, if the patient were removed to an atmosphere sufficiently dry and rare to hold pulmonary tuberculosis in check, it would have a like good effect on the laryngeal condition.

Dr. DUNCAN had seen many of the cases of laryngeal phthisis in which the laryngeal ulcers were healed by prolonged daily mild applications, mentioned by Dr. Bosworth, and he could bear testimony to the fact that the ulcers disappeared and the laryngeal symptoms were removed. This did not stop the advancement of the pulmonary phthisis, but removed the annoying and painful symptoms in the larynx.

Dr. INGALS, in closing the discussion, said that he was much gratified at the debate which had been excited, and considered that the object of his paper had been accomplished. As to the question of diagnosis, raised by Dr. Bosworth, he was not prepared to accept the dictum that the peculiar boggy swelling necessarily accompanied the disease. He thought that when the evidences of pulmonary phthisis were unquestionable, one need not hesitate to pronounce co-existing laryngeal disease as of the same character, even though the swelling did not appear. But when this swelling existed together with the pulmonary signs, the diagnosis was certain. He noticed, from what had been said, that prolonged mild treatment seemed the most satisfactory, and here the key-note had been struck. His fear that iodoform is of little use in these cases is due to the fact that patients in whom he had used it continuously for a long time had shown no local evidence of change until other remedies had been substituted. The patient he referred to, who had been sent to Colorado, was sent there because of the pulmonary disease, the laryngeal complication being considered unimportant. He believed that the dry and rarefied air of that locality is not desirable in most cases where there is extensive tuberculous ulceration in the larynx.

Dr. JARVIS said that the difference in appearance in the phthisical and syphilitic ulcer is distinctive, and there was no excuse for

confounding the red areola of the latter with the pale, grayish appearance of the former. The co-existence of the gray ulcer and the pyriform thickening over the arytenoid with the phthisical pulmonary signs, also tends to confirm the correctness of the diagnosis. Inasmuch as inhalations have no curative effect upon the simple traumatic ulcer in the mouth, he failed to see what benefit could be derived from their use in treatment of the ulcer of laryngeal phthisis. As iodoform so markedly benefited simple buccal sores, so we might find it a valuable application in ulcerative laryngeal phthisis.

Paper.

PARESIS OF THE CONSTRICTOR MUSCLES OF THE PHARYNX, SIMULATING SPASMODIC STRICTURE OF THE ŒSOPHAGUS, WITH REPORT OF CASES.

By FRANK H. BOSWORTH, M.D.

I ASK your attention to some brief clinical observations on the above topic, together with a report of a number of cases which have come under my care within the past few years. I speak of them as simulating spasmodic stricture of the œsophagus, from the fact that in one of the cases this resemblance was so marked as to somewhat mislead me, and that, morever, Mackenzie and others, in mentioning the disease, say that it is always associated with paralysis of the œsophagus, a condition closely associated with spasmodic stricture.

The condition to which I call attention is not the paralysis so frequently a sequela of diphtheria, nor again that associated with glosso-pharyngeal paralysis or other neurotic diseases, but one purely myopathic in its origin and chronic in character. I shall commence with the narration of the cases.

Case 1.—On March 5, 1881, I was consulted by a gentleman from Virginia with the following history: He had always enjoyed perfect health, had never had syphilis or any other disease. His life had been an out-door life, carrying on a large farm. Age sixty-three. Five years ago he had noticed some little difficulty in swallowing; not marked, but still sufficient to cause a slight annoyance. This had disappeared for a while, but again occasion-

ally reappeared. Within a year the difficulty had been more prominent, and in three months past, had become so serious that he had been unable to swallow any solid food, and of late the swallowing of liquids had become difficult. In swallowing solids, the bolus was passed into the throat, where it lodged, and he could pass it no farther, and was compelled to void it in order to breathe. In swallowing liquids he succeeded, but it was an exceedingly slow process; the fluid being passed into the throat in small quantities, and apparently being allowed to make its way into the œsophagus by the force of gravity.

When I saw him and examined him, my first impression, on watching him swallow a small portion of water, was that his trouble was œsophageal stricture, but on passing a bougie I found no obstruction whatever. On inspection of the fauces, my attention was notably attracted to the emaciated appearance, if I may use the word, of the posterior pharyngeal wall. Its mucous membrane was of a light pink color, apparently very thin, and stretched, as it were, over the bodies of the vertebræ. On irritating the region with a probe I failed to excite any reflex movement of the pharyngeal constrictors, but there was an entire absence of that yielding, cushion-like softness noticeable in a healthy pharynx. I then made use of a strong faradic current, applied in various ways, but failed to secure any reaction in the muscles. The man was at the time feeble and much emaciated from lack of nourishment. I immediately put him on use of full doses of strychnia, made daily use of the faradic current, and instructed his attendants in the use of the stomach tube, directing that the most nourishing liquids be administered five times daily. He remained under observation three weeks without relief. At no time was I able to obtain any reflex movement of the muscle under the use of the electric current, though his general health improved somewhat under the vigorous course of artificial alimentation. He became discouraged and returned to his home, and I was informed of his death occurring in the latter part of April. No new symptoms developed, and he died of exhaustion. His end was undoubtedly hastened by his extreme depression of spirits and his aversion to the method of feeding by the tube.

Case 2.—On Dec. 17, 1881, I was consulted by J. S. V., aged fifty, with the following history. Fifteen years ago he had an ulcerated sore throat, and was under treatment for a year for syphilis; with this exception he had always enjoyed perfect health. For two

months he had noticed a difficulty in swallowing, which had increased to the extent that in the past two weeks he had been unable to swallow any solids, any attempt at swallowing a solid bolus of food resulting in its lodging in the back of the throat and causing a violent choking attack. He seemed to be well nourished and in perfect general health. An examination of his pharynx with a probe showed somewhat diminished sensibility, and but feeble reaction of the pharyngeal muscles, though there was undoubted motion. There was no noticeable emaciation in that region. With the æsthesiometer the perceptive distance was, both vertically and horizontally, a quarter of an inch. With the faradic current, one electrode applied to the pharynx and the other to the back of the neck, the reaction was decidedly sluggish.

He was put on strychnia, gr. $\frac{1}{12}$ *t.i.d.* and was seen three times each week, and the electric current applied as above. The improvement was rapid and most satisfactory. At the end of three weeks I saw him for the last time, when he could swallow solids with no difficulty. I should say that during the first two weeks of treatment, the use of solid food was forbidden.

Case 3.—Mrs. A. J. S., age fifty-eight, consulted me Aug. 18, 1882, complaining that for three years she had been troubled with a difficulty in swallowing, which was on the increase. She could take solids but with great difficulty, being compelled to swallow deliberately, the act occupying some time to complete. Her general health was fairly good, and she presented no symptom of any general or local nervous disorder. An examination of the pharynx showed nothing noticeably abnormal on gross inspection. The probe, however, showed noticeably sluggish reaction of the constrictors. With the æsthesiometer the perceptive distance was a scant $\frac{1}{4}$ inch.

This patient came from out of town, and I could not see her often. I therefore gave her the following:

℞

	Strychniæ,	gr. ii.
	Acid. phosphoric. dil.,	℥ ss.
	Tinct. ferri,	ʒ iii.
	Elix. simpl. ad.	℥ iv.
Sig.	One teaspoonful before each meal.	

I also directed her to change a somewhat sedentary in-door life for a more active out-door habit, and ordered the daily use of cold sponging of the neck and shoulders each morning, and, moreover,

that no solid food should be taken for the present. I saw the patient once each week. As the progress was most satisfactory, at the end of two weeks she commenced taking solids moderately. I last saw her on Feb. 20, 1883, when she reported herself entirely well.

CASE 4.—Mrs. G. D., age forty-six, consulted me on March 15, 1883, with the following history: Eight years ago, she first noticed difficulty in swallowing. The bolus seemed to lodge in the throat, and she was unable to carry it down. This gave her not much annoyance at that time, but had slowly increased, until during the past winter it had been much worse. For a week she had taken no solids, though liquids were swallowed without difficulty. An examination showed a noticeable sluggishness of the pharyngeal muscles when irritated with the probe, the response being feeble and the motion quite limited. The other muscles of the fauces were normal. The æsthesiometer showed a perceptive distance of $\frac{1}{4}$ inch. With the battery the reaction was fairly normal. There was no apparent emaciation of the pharynx. She was directed to refrain entirely from the use of solids, and to take the same prescription as given in Case 3.

This patient was under observation six weeks, and last seen May 1st, when she was entirely well.

CASE 5.—A married woman, age forty-seven, consulted me on March 2, 1883, with the history of slightly difficult deglutition extending back four years.

For six months this had been increasing in a marked degree. For a week she had been compelled to use liquid food alone, any attempt to swallow solids causing violent choking attacks, the bolus apparently lodging over the entrance to the larynx. Her distress would be very severe until she succeded in removing the mass with the finger, either pushing it down or drawing it out. An examination revealed, as in the other cases, a notably sluggish action in the constrictor muscles, both on stimulation with the probe and by the faradic current.

She was put on the use of strychnine; solid food was interdicted, and cold sponging with out-door exercise enjoined.

This patient is still under observation, but the improvement has been most satisfactory. She is now taking solids in moderate quantities, and swallowing with comparative ease.

I have brought these clinical reports before you mainly as bearing on what we have been taught to call myopathic

paralyses. In none of these cases was there any evidence of a prominent neurotic element. The paresis of the constrictors constituted the whole disease, and it is this affection existing alone, and not as a part of any other disease, such as glosso-pharyngeal paralysis, etc., to which I would call attention, making it the text for a few very brief considerations on the subject of overworked muscles. Muscles which are overworked show a tendency sooner or later to break down. Those muscles which are kept in the greatest state of activity show this tendency in a more marked degree. This tendency is still more marked if the muscle lies immediately beneath a mucous membrane in a state of chronic inflammation, the muscular fibres being undoubtedly to an extent weakened by the extension of the even slight inflammatory process.

The busiest and hardest working muscle in the body is the heart. In it are combined ceaseless activity and exceedingly laborious activity. Hence more than any other single muscle in the body do we find the heart subject to myopathic deficiencies.

Next to the heart we find perhaps no busier muscle than the abductor muscle of the larynx. In this muscle, then, also, we find a tendency to paresis. Its activity is ceaseless, commencing with the first breath of life, and ending only at the grave; but while it is a ceaseless activity, it is not a laborious one. The mere act of rotating the arytenoid cartilages outward requires the expenditure of but a small force. We find, therefore, that paresis of this muscle is a somewhat rare occurrence, but that there is an inherent tendency in it to paralysis, which does not exist in the other muscles supplied by the recurrent laryngeal nerve, it seems to me, cannot be questioned, excepting perhaps the tensor muscle, which, however, as will be noticed, possesses other elements of weakness. Semon, in commenting on paralysis of the abductors, heads his article: "The inherent tendency of the abductor fibres of the recurrent laryngeal nerve to become paralyzed." He states a clinical fact for which he offers no explanation. The clinical fact I regard as fully established by the recent cases reported of pressure on the recurrent

laryngeal nerve giving rise to abductor paralysis. Semon's deduction I cannot accept. The true explanation of these cases is in the fact that the hardest-working muscle, as the overworked animal, is the first to break down under a strain. In the case of abductor paralysis, the nerve-supply is cut off from all the muscles. The result is that the hard-working muscle breaks down first.

The thyro-arytenoid muscle is another striking illustration of this tendency. This is an exceedingly busy muscle, and one whose activity is most laborious. It is a small, slender muscle, but when its bulk is considered in connection with the work it is compelled to do, that it should be very frequently the seat of myopathic paresis is not to be wondered at. Another source of weakness here is the fact that the muscle lies immediately beneath the mucous membrane lining the larynx. A chronic catarrhal inflammation of the membrane is most common, and, when existing, I think, acts to weaken the muscular fibres by some slight extension of the morbid process. Paresis of this muscle is far more common than of the abductor, though the latter is a far more busy muscle; but while the abductor is never at rest, its work is very light; on the other hand, the tensor, while getting an occasional rest, when on duty is compelled to do much laborious duty. Especially is this true when the higher power of the larynx is brought into action, as in the singing voice. The most important muscle in the larynx to the singer is undoubtedly the thyro-arytenoid, which, in the main, is a tensor muscle, and on which the pitch of the voice depends. It is the very frequent seat of myopathic paresis. The explanation is very simple. In the singing voice the lower and middle registers are taken with ease in most cases. That the notes of the higher register be brought out in clear, round tones, it is absolutely essential that the nasal and pharyngeal centres be in a thoroughly healthy condition. If they are not, the singer misses something in his tone, it is muffled to an extent, and he tries to overcome the deficiency by an additional effort—in fact, by forcing his voice. The result is a strained voice, from weakening of the tensor muscle.

I have thus departed very materially from my original topic, but my main idea has been to bring before you the question of myopathic paralysis. The subject has undoubtedly been much obscured by the formerly prevalent idea that we must seek for the cause of these troubles in the nervous system. This idea was fostered also, I think, by the earlier writers giving the name paralysis to these affections of the individual muscles.

As regards paresis of the constrictors of the pharynx, the main points have been covered in the histories narrated. The source of the trouble in all these cases was undoubtedly primarily in the muscles themselves. The first element of weakness was in the chronic pharyngeal catarrh extending somewhat to the muscular fibres. The weakened muscle, called upon to do its ordinary work, broke down, and grew gradually weaker, until, with rest and proper treatment, its integrity was restored.

The treatment in all cases was rest, the interdiction of solids, strychnia, fresh air and bathing, and in all but the first case was successful.

Discussion on Dr. Bosworth's Paper.

Dr. COHEN said that he regarded such cases as largely hysterical, and the greatest success in treatment under his own care had followed enforced deglutition under the supervision of a competent nurse, himself being present at the earliest attempt.

Dr. KNIGHT remarked that the loss of contractility of the muscles under electrical stimulus in the cases reported, made them distinct from those coming under his own observation. Most of the cases he had had were due to hyperæsthesia, and were overcome by passing bougies, or by the application of astringents and remedies calculated to relieve the hypersensitiveness.

Dr. BOSWORTH said that hysteria was excluded from the diagnosis by the fact that there was sluggishness of the muscle not only in respect to electricity but to mechanical stimulation. The hyperæsthesia had been suspected of causing the symptoms, but in some cases there was anæsthesia. In most of them undoubtedly the mucous membrane was unduly sensitive, and there was decided feebleness of the muscle.

Dr. LANGMAID said that in cases of his similar to Dr. Bosworth's, he had always been satisfied with the results obtained by the repeated passage of graduated bougies.

Second day. Morning session.

Business Meeting.

The meeting was called to order by the President at ten o'clock.

The report of the Secretary, D. BRYSON DELAVAN, M.D., was presented and accepted.

The report of the Treasurer was also presented by Dr. Delavan, as follows:

By receipts for the fiscal year, 1882–3 . .	$781 12
To amounts paid out	729 97
Balance	$51 15

Examined and found correct.

SAML. JOHNSTON,
E. C. MORGAN,
Auditing Committee.

On motion, the report was accepted.

The report of the Librarian, FRANK H. BOSWORTH, M.D., was presented.

The Librarian regretted to report a somewhat diminished interest in the library for the past year, the contributions having been even less than for the year before, and stated that the library, though small, contained many publications of value. It was to be hoped that the members of the Association would not permit their interest in this feature of the work to lapse.

The additions to the library for the year comprised nine (9) monographs.

On motion, the report was accepted.

The Chairman of the Committee on Nomenclature, Dr. J. SOLIS-COHEN, presented the printed scheme submitted at the last Congress of the Association, and moved its adoption. The motion was seconded by Dr. Knight.

Dr. SEILER said that the report was upon a subject of very great importance, and he recommended its discussion by the Fellows before its adoption. He begged to suggest one or two additions. Under the head of "Ulcerative diseases of the pharynx," he would suggest the addition of "Phthisis of the pharynx," several cases of which had been reported to the Association at former meetings. Among the neoplasms he

noticed that the Committee recommended "Enchondroma." He would prefer the term "Chondroma." For "Periostosis" he would suggest "Osteoma," which would include bony tumors, whether inside or outside of the periosteum.

Dr. COHEN said that he would suggest a few changes himself. For "Phthisis of the larynx" he would suggest "Tuberculosis of the larynx." Among the neoplasms, he would place "Lymphomata," in addition to "Adenomata."

Under the laryngo-pharynx, anatomical, he would add "Plica glosso-epiglottica," and under the larynx he would suggest changing "Chorda vocalis" to "Plica vocalis." Among the inflammatory disorders, in addition to "Laryngitis acuta gravior" he would suggest "Laryngitis acuta œdematosa." He did not know whether or not "Laryngitis granulosa" would cover the plastic form similar to that so often found in the nose and pharynx. It seemed that a different name might be used to describe this condition. Among the ulcerative diseases, he would also substitute "Tuberculosis" for "Phthisis." Among the neuroses, that of the inferior laryngeal nerve should be included. He would also insert "Tuberculosis of the trachea" and "Os turbinatum acessorium" under their proper headings. Among the neoplasms, "Periostomata" would be better than "Periostosis." Under diseases of the nose, among the neuroses, he would suggest the placing of "Hyperosmia."

Dr. LEFFERTS remarked that enough had been said to prove that the report was incomplete, and he thought that the work would be better done by a smaller committee; he suggested such a reference of the report for final action next year.

Dr. COHEN opposed reference of the subject again to a committee, and declined to serve For five years the Committee had considered the subject, and he thought that it had done its work, and should be discharged.

Dr. DELAVAN said that at the last meeting he had distributed among the Fellows of the Association two copies of the scheme presented by the Committee, in order that one might be sent to him corrected. None, however, had been returned.

Dr. KNIGHT said that he understood the copies were distributed in order that the Fellows might examine them at their leisure, and come prepared to discuss them. Although he would not urge the consideration of the matter at this meeting, he believed that the Association might be prepared to act upon it

now. Most of the Fellows understood the changes which they would like to make. He would state that in adopting their report, there were certain general principles in nomenclature which would have to be carefully considered. For instance, Dr. Cohen would substitute "Tuberculosis" for "Phthisis." He believed that there would be doubt in the minds of some members whether all cases of phthisis of the larynx were really tuberculous. In the same way he doubted the wisdom of suggesting new names for those well known, except for good cause. He would prefer to retain the term vocal cords in place of the term proposed by Dr. Cohen.

Dr. INGALS suggested, that since the Committee had devoted a long time to the consideration of the subject, it might be well to refer it to a smaller committee in another city.

Dr. BOSWORTH thought that the result of the Committee's work was admirable, and offered very little for criticism. He would now suggest that the matter be referred to the Council, in order to be brought before the Association at its next meeting, with such changes as it would suggest.

Dr. COHEN accepted the suggestion and asked that the Council be instructed to assign two hours on the morning session of the second day, at the meeting of 1884, for the discussion of the report, in order that the subject might be finished.

Dr. BOSWORTH offered the following motion :

Resolved, That the report of the Committee on Nomenclature be accepted, and the Committee discharged, with thanks ; that this report be referred to the Council of this Association ; and that a definite hour in the proceedings upon the morning of the second day of the session 1884 be assigned for its consideration.

The motion was unanimously adopted.

The Committee on Diploma and Seal, through the Chairman, FRANK H. BOSWORTH, M.D., reported progress.

On motion the report was accepted.

Dr. KNIGHT submitted the following resolution and moved its adoption :

Resolved, That the same arrangement be made with the ARCHIVES OF LARYNGOLOGY with regard to the publication of the papers and proceedings of the American Laryngological Association as was made last year.

The motion was carried.

The report of the Nominating Committee was presented by the Chairman, F. I. KNIGHT, M.D., as follows :

OFFICERS: 1883–84.

President.—F. H. Bosworth, M.D., of New York.

First Vice-President.—S. W. Langmaid, M.D., of Boston.

Second Vice-President.—S. Johnston, M.D., of Baltimore.

Secretary and Treasurer.—D. Bryson Delavan, M.D., of New York.

Librarian.—T. R. French, M.D., of Brooklyn.

Council.—Beverley Robinson, M.D., of New York.

Place of meeting, New York City. Time of meeting, third Monday in May, 1884.

Dr. J. SOLIS-COHEN gave notice that he should offer at the next meeting (1884) an amendment to the Constitution, extending the limitation of membership to sixty Fellows.

The President stated that, under the rules, this amendment would lie over.

Dr. E. C. MORGAN stated that it was his desire to direct the attention of the American Laryngological Association to the present uncertain financial status of the Library of the Surgeon-General's Office at Washington. We were all deeply concerned in the continuance of this admirable and complete collection of books, now numbering, including pamphlets, over 100,000. The great value of this library to us, as students, could not be over estimated, for it was especially rich in contributions to literature which could not be replaced at any price.

The annual appropriations by Congress are so small as to render it almost impossible to procure books and continue the publication of the great Index-Catalogue. It was further proposed to merge the medical library into the Congressional Library,—thus destroying forever the identity and usefulness of an institution of which we, as American physicians, can be proud.

The entire question was receiving serious consideration from many of our State societies, and should be acted upon by this Association.

In view of these considerations he begged to offer the following preamble and resolutions:

Whereas, This Association has observed that the bill reported in the last session of Congress by the Committee on Public Buildings, recommending the erection of a fire-proof building in which to place the Library and Museum of the Surgeon-General's office, failed to become law; and in view of the signal utility and value to its members, as well as to the medical profession

generally, of the unrivalled collection of books forming the library—it is, therefore,

Resolved, That the American Laryngological Association regard it as the clear duty of the Forty-eighth Congress to make the necessary appropriations for the erection of a fire-proof building, to contain the treasures in question, which, if destroyed, would be absolutely irreplaceable.

That Congress should be respectfully urged to make the annual appropriation sufficient for the purchase of all new works pertaining to medicine, and to authorize the completion of the Index-Catalogue for the benefit of the medical profession of the United States.

That, in the opinion of this Association, the Library and Museum should under no circumstances be dissevered, but should be kept under the same management, which has made them what they are.

That we pledge ourselves individually to make these views known to Senators and members of Congress as far as we are able.

Dr. COHEN, in seconding these resolutions, urged their adoption, and Drs. DELAVAN and ROE also spoke in their favor.

The resolutions were unanimously adopted.

Dr. MORGAN then offered the following:

Resolved, That a copy of these resolutions be sent to the presiding officer of the Senate, and to the Speaker of the House of Representatives, at the next session, signed by the President and the Secretary of this Association.

The motion was carried.

The business meeting was then adjourned, and a recess was declared until eleven o'clock, the time appointed for the reading of papers.

Open Session.

T. R. FRENCH, M.D., read a paper on "Photographing the larynx."

Paper.

ON PHOTOGRAPHING THE LARYNX.

BY THOMAS R. FRENCH, M.D.

AT the last session of this Association, I presented several photographs of the larynx taken with the assistance of Mr. George B. Brainerd, of Brooklyn, only a few days before the meeting.

Since then we have made numerous experiments with various forms of apparatus, all of which have been constructed by Mr. Brainerd.

This gentleman's assistance has been simply invaluable. He is a civil engineer by profession, and became interested in the larynx and laryngoscopy immediately after I had incised an abscess in his larynx, which had begun to interfere with respiration. I soon succeeded in teaching him to examine his own larynx, and seeing that he was much interested in the study of its movements, and knowing him to be an expert amateur photographer, I broached the subject of photographing the laryngoscopic image. He entered into the solution of the question with the spirit of scientific inquiry, and, because of his untiring industry and great ingenuity, has been mainly instrumental in enabling me to present to-day these photographic pictures of the interior of the larynx.

We demonstrated last year that the larynx could be photographed, but with that process the throat-mirror and camera were in fixed positions, and the head of the patient had to be drawn up to the mirror and arranged to suit its position, which of course necessitated very tolerant fauces in order to succeed. We realized that photographs taken in this way could have but a limited value in the study and demonstration of diseases of the larynx, and, therefore, our objects this year have been :

1. To simplify the procedure, and so convert that which before was only an interesting experiment into an operation of practical utility.

2. To take a better photograph.

In the fulfilment of both of these objects we believe that we have been successful, for, as I shall show farther on, we have adapted a hand-camera, with which the larynx of persons having only fairly tolerant fauces can, in the majority of instances, be photographed by any laryngoscopist ; and I have for presentation to-day a number of photographs taken with the stationary apparatus, which are an improvement on the results of last year.

The hand-camera will not produce as large or as satisfac-

tory pictures as the stationary apparatus, but, as the results of some of the work done with it will show, they are clear enough to make out the various structures of the normal larynx, or diseased conditions if they exist.

The photographs shown last year were taken with a camera about the size of a segar box placed upon a tripod, and with the throat-mirror attached by a flexible rod to the camera. Unaided sunlight alone was used for illumination. The best photograph taken with that apparatus is probably familiar to all the Fellows of the Association. The sources of illumination used in the experiments made this year were unaided sunlight, condensed sunlight, oxyhydrogen, magnesium, and electric lights.

With unaided sunlight plane reflectors were used. In order to increase the power of illumination from sunlight, and at the same time to avoid material increase of heat, Mr. Brainerd devised and constructed a condenser, which answers the purpose so well that it deserves a description. It consists of a box 10 inches long, in one end of which is placed a double convex lens 5 inches in diameter, which has a focal distance of 13 inches. At the outer end of a short tube fitted into the other end of the box is a plano-concave lens $1\frac{7}{8}$ inches in diameter. This is placed an inch or so inside of the point of focus of the double convex lens, and in that position intercepts the converging rays, and makes them parallel or divergent, according to its distance from the first lens.

When sunlight is made to pass through these lenses the result is one of the most beautiful and powerful lights, without material heat, that I have ever seen. Both light and heat can be controlled by diaphragms of varying size, to be introduced between the lenses when the sun is very bright.

With this condenser both the plane and concave reflectors were used. The electric-light used was produced by one of Wood's 6,000 candle-power focussing lamps, which the Fuller Electric Light Co. courteously placed at our disposal for our experiments. A 2,000 candle-power Fuller lamp, such as is used for street illumination, was suspended

from the ceiling by a rope and pulleys for our use, but the light produced by it was found to be too small and weak to illuminate all of the larynx at the same time. It was therefore discarded without experiment, and Wood's powerful focussing lamp without the reflector substituted.

With this light reflected from both plane and concave reflectors, sixteen exposures were made with the small camera. The best results were obtained from the use of the plane reflector; but the photographs taken in this way were no better than those resulting from the use of unaided sunlight, and not as satisfactory as those obtained when condensed sunlight was employed.

The illuminating power of this light could certainly have been increased by the use of a condenser, but the experiment was not made, for the light as it was, proved to be very trying and dazzling to the eyes of both Mr. Brainerd, upon whom the experiments were made, and myself.

The experiments with sunlight were made with a variety of cameras, all of which, with the exception of two, have been discarded. Of these, one is a stationary camera and the other is intended to be held in the hand while the photograph is being taken.

The stationary apparatus consists of two tubes, one inch in diameter, moving one within the other. The lens, a plano-convex achromatic of five inches focus is set in the distal extremity of the outer tube, and an ordinary plane or concave reflector is suspended in front of it; upon the side of the tube an adjustable arm is fixed, which carries the throat-mirror; at the other end of the inner tube is the exposing apparatus, consisting of a perforated drop shutter and a slide for the holders containing the sensitive plates. The whole is fixed to a flat wooden base.

Here are a number of photographs (see plate facing page 235, ARCHIVES OF LARYNGOLOGY, Vol. iv, No. 4, Oct., 1883) of the larynx taken with this apparatus, which are presented to show what can be done. While they are much better than those of last year, they are of no great practical value, for in order to secure them the patient and camera must be placed in fixed positions, which precludes

the possibility of using the apparatus upon a large majority of patients who come under observation.

(Figs. 1, 2, 3, and 4 of plate are artotype reproductions of the best photographs taken with the stationary camera exhibited at the meeting at which this paper was read. The re-

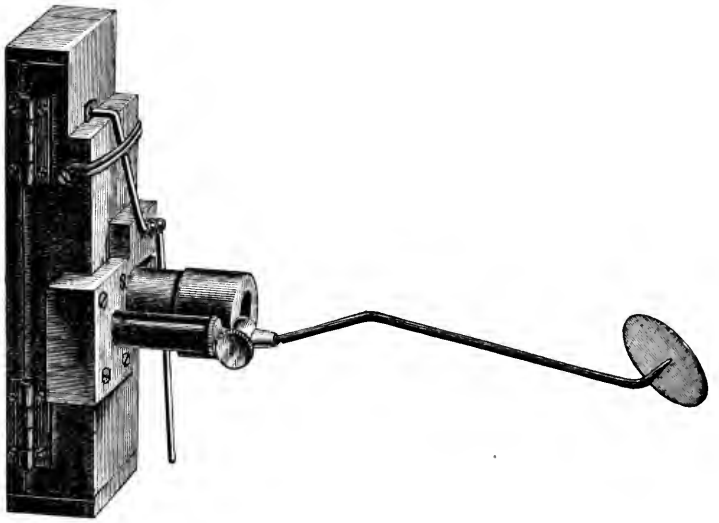

FIG. 1.

productions are, of course, not as clear as the photographs.)

The small camera (Fig. 1) is intended to be held in the hand while the picture is being taken. It consists of a box $4\frac{1}{2}$ inches long, $1\frac{7}{8}$ inches wide, and $\frac{3}{4}$ of an inch in thickness. The back opens upon hinges, and admits of the introduction of either the ground glass or plate-holder. On the anterior face, a tube $1\frac{1}{8}$ inches long is attached, in the outer end of which the lens is placed. This lens has a focus of $1\frac{1}{4}$ inches.

At the side of the tube a part of the handle of a throat-mirror is fixed, and into that the shank of a throat-mirror is passed and fastened by a thumb-screw. The shank of the mirror is somewhat curved, and is attached to the side of the frame holding the mirror. The object of this is to allow of the lens being held opposite any part of the opening of the mouth, and also to prevent the possibility of a shadow being cast upon the mirror.

In the front part of the box is a shutter made of lead, and perforated with a hole just the size of the lens. The shutter is held in position by a lever acting as a key, on the anterior face of the camera.

The apparatus is used in the following manner:

I have sketched upon this plate (Fig. 2 shows the plate reduced) the relative positions of patient, observer, camera,

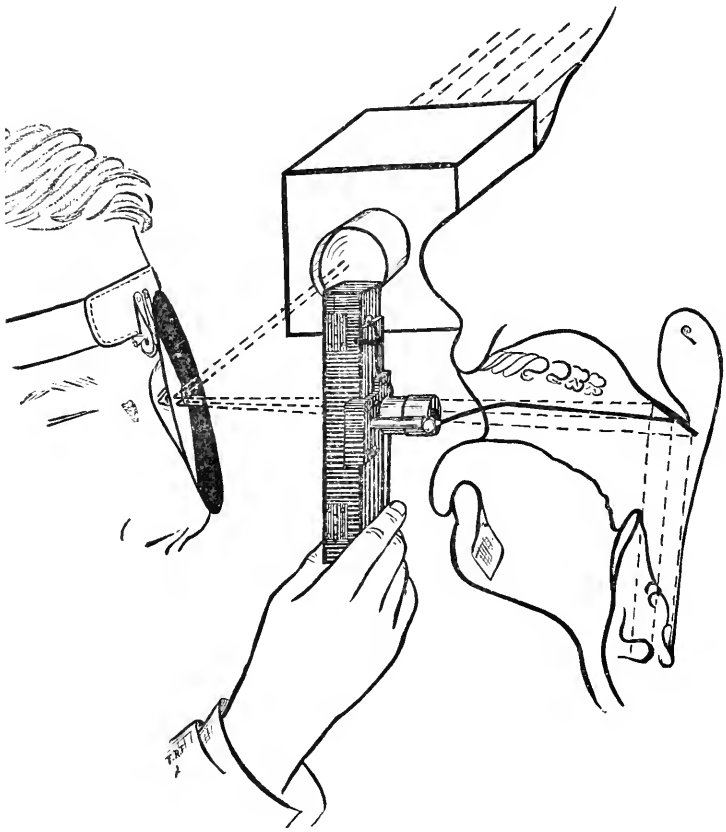

FIG. 2.

and condenser in the procedure about to be described, a reference to which will, perhaps, aid you in understanding the description.

A reflector, either plain or concave, attached to a head-band, is arranged over the left eye so that the pencil of sun-

light from the solar condenser is received upon it and thrown into the mouth. The patient, with the head inclined slightly backward, now protrudes the tongue and holds it well out between the forefinger and thumb of the right hand.

The throat mirror with camera attached, held in the right hand of the observer, is placed in position in the fauces, and the light adjusted so that the larynx can be seen, with the observer's left eye, to be well illuminated.

If, now, the tongue does not mount up above the level of the lower edge of the lens, and the lower edge of the mirror, it may be taken for granted that, when the plate is exposed, the picture received upon it will be nearly the same as that seen with the left eye in the throat-mirror. The photograph is taken by pressing upon the key with the index finger; this releases the shutter which, in falling, makes an instantaneous exposure, amounting, perhaps, to one seventh of a second.

In using condensed sunlight with the small camera, it is important to throw the circle of light from the inner side of the reflector—that nearest the nose,—for in this way a part of the larynx exposed to the lens of the camera may be illuminated, which cannot be seen with the eye. To insure this, it is best to cover the outer half of the reflector with black silk.

On account of the parallax or displacement of the image due to the difference in point of view between the eye and the camera, some skill is necessary in managing the illumination, so that the part which it is desired to bring out will be exposed to the lens if not to the eye.

Here are a number of photographs taken with this, the small camera, showing normal and diseased larynges in various positions. Some of them are so small—the pictures of the larynx themselves measuring only about $\frac{1}{8}$ or $\frac{3}{16}$ of an inch in diameter—that they cannot be satisfactorily seen without the aid of a magnifying glass. In order to make them clear to the unaided eye it is necessary to enlarge them. On account of the short time which has elapsed since these photographs were taken, satisfactory en-

largements could not be obtained. (Fig. 5 of plate is an artotype reproduction of one of the many photographs taken with the hand-camera exhibited at the meeting at which this paper was read. It does the photograph great injustice, but is shown because of the fact that it is *the first photograph taken of the image of a diseased larynx.* It represents perichondritis in laryngeal phthisis. Fig. 6 of plate is a reproduction of a photograph of a portion of the rhinoscopic image taken with the hand-camera. It shows hypertrophied membrane, due to catarrh, on both sides of the septum, and portions of the middle and inferior turbinated bones of the right side.)

These photographs are not as large or clear as desirable, but allowance must be made for the fact that an ordinary plano-convex achromatic lens was used, which was not constructed with any special reference to photography, and the pictures taken with it bear about the same relation to those that would be produced by a regularly constructed photographic lens, that the tin-type of the itinerant photographer bears to the imperials of a Sarony or a Kurtz.

It may be asked, Why have we not used the best lens that could be obtained? to which we would answer that our plan from the first has been: first, to attain the result aimed at, and this has only just been reached; and then to eliminate objectionable features and perfect the product.

Any want of sharpness in the views must be attributed to the imperfection of the lens or inaccuracy in focussing, for the closest inspection will not show any duplication of lines, such as would result from a movement of the parts during exposure.

Experience has shown that the apparatus may be improved in several ways. By adding a larger lens the size of the pictures could be doubled, without increasing the size and weight of the present camera more than one third.

Mr Brainerd suggested the following, and had time allowed, the suggestions would have been carried out:

The use of a wide-aperture combination lens to flatten the field and increase the sharpness of the image. The addition of a micrometer for more delicate focussing, and

to contribute to the sharpness of the image. The use of an exposing drop to be actuated by a spring instead of by gravity, in order to shorten the exposure when the light will warrant it. This might be placed in front of the lens to protect it from the breath of the patient. Setting the lens on one side of the centre of the plate to give a more nearly coincident vision of eye and camera.

The development of the plates is a very simple matter, and a knowledge of it can be readily acquired, so in taking pictures with the hand-camera the services of a photographer are not necessarily required.

The results of the experiments made this year may be summed up as follows:

1. Better photographs have been taken with the stationary apparatus than those of last year.

2. A camera has been so adapted that it can be held in the hand and quickly placed in position. This makes it possible to photograph the larynx in patients whose fauces are only moderately tolerant.

3. The photographs are taken instantaneously, by a drop shutter, thus making it possible to photograph the larynx, even if the parts are in motion.

4. The parts reflected in the mirror are alone exposed, thus avoiding the confusion which arises when the mouth and lips are included and out of focus.

5. As the apparatus is so small, and the exposure is made instantaneously, if desirable, photographs can be taken without the patients being aware of the object of the procedure.

6. Several diseased conditions of the larynx have been photographed. This is an important step in advance, for we believe that it is the first time that it has been accomplished.

7. Portions of the rhinoscopic image have been photographed. These photographs show, among other things, hypertrophy of the mucous membrane covering the posterior portion of the nasal septum.

So far as we are aware, this is the first time that any portion of the posterior nares has been photographed.

Discussion on Dr. French's paper.

By request of the lecturer, discussion on the paper was postponed until the end of the morning session, in order that Fellows might have an opportunity of examining the photographs presented.

Dr. KNIGHT spoke in commendation of the work of Dr. French, and expressed great gratification at the improvement made since last year. Although few members probably were competent to discuss the method, or to offer suggestions upon the subject, he thought the pictures submitted showed a great gain, and demonstrated that something really practical might ultimately come from photographing the larynx, and he hoped that Dr. French would be induced to continue his work in this field.

Dr. SEILER noticed a decided advance in the photographs over those of last year. As an amateur photographer himself he could sympathize with some of the difficulties experienced by Dr. French, and suggested that possibly some improvements might be made in the apparatus, especially in the management of the drop shutter.

Dr. FRENCH said that the encouraging remarks made would certainly stimulate both Mr. Brainerd and himself in their future experiments.

In reply to Dr. Seiler, he said that he thought that there would be no difficulty in finding the proper attachments as soon as the size of the camera was decided upon. He felt that the principle had been found, and believed that a camera which would produce larger and perhaps perfect photography would soon be produced.

In the absence of H. A. Johnson, M.D., of Chicago, Dr. Mackenzie, of Baltimore, was appointed to read his communication.

Paper.

REPORTS OF FIVE CASES OF CONGENITAL TUMOR OF THE LARYNX.

BY H. A. JOHNSON, M.D., LL.D.

THESE cases are reported to the Association for the reason, as it seems to the writer, that, with the exception of the monograph of Causit, published in 1867, the subject has not received the attention at the hands of laryngolo-

gists which it deserves. It seems probable, also, that congenital troubles of this character escape detection. In the absence of articulate speech the abnormal condition of the voice is not always recognized. It is quite possible that cases of laryngeal tumor are occasionally taken for thymic asthma, and, possibly, for cardiac malformation.

For the histories of the first two cases I am indebted to my friend, Dr. M. Manheimer, of Chicago.

Case 1.—April 20, 1880, C. H., a female, was brought to Dr. Manheimer for examination and advice. The father was consumptive, the mother was anæmic. The child was at the time of the consultation ten weeks old. The face was livid; extremities cold; pulse small, 130, and very feeble. From birth the child had breathed with great difficulty. There had been hoarseness and spasm. The little patient died on the 23rd of April, three days after the consultation. Upon autopsy there was found in the larynx a papillomatous tumor, nearly filling the glottic chink.

Case 2.—C. M. was brought to Dr. Manheimer for a difficulty in the throat. Both parents were healthy. The child was a female, strong, and well in all respects, with the exception of the throat trouble. She was then sixteen months old. She had suffered from birth with hoarseness and paroxysms of dyspnœa. The symptoms were not uniform. At times there was great difficulty of breathing, and this was succeeded by an interval of nearly normal respiration. Spasm was especially noticed during and after crying. Only once did the voice become entirely extinct. The heart, lungs, and abdominal organs were all sound. Dr. M. diagnosed laryngeal tumor, congenital, and suggested an effort to remove it by operation. An engagement was made for the writer to see the patient with Dr. M. In the meantime whooping-cough was contracted. This was mild in character, and did not give rise to any alarming symptoms. During one of the paroxysms of coughing, the little one expelled a mass of reddish matter, which, upon examination, was found to consist of a papillomatous growth covered with mucus. The tumor was of the size of a small bean, (a lentil). From this time the hoarseness disappeared, and with the recovery from the whooping-cough there was no more disturbance of respiration. The case was cured. The voice has continued good.

Case 3.—In the winter of 1876–7, Dr. Manheimer referred to me for examination the child of Mr. and Mrs. F., of Chicago. The

little one was three years old, well grown, and of healthy appearance. The parents were both healthy. I learned the following history: From birth the cry was unnatural, hoarse, and croupy. There had also been paroxysms of dyspnœa. These attacks became more frequent and more severe as he grew older. Dr. M. and myself both recognized evidence of a tumor in the larynx, and believed that it was congenital. In the spring of 1877, the dyspnœa became more constant, and as there had been nothing accomplished in the way of removal of the growth, it was thought best to perform tracheotomy. This was done by the writer in April, 1877. The relief to the dyspnœa was complete, and the patient regained his general good health, which had been greatly impaired by the almost constant struggle for breath. During the next year there was no progress made in the effort to remove the tumor through the natural passages. In the meantime there had begun to develope spasm, though the canula was free, and, so far as we could judge, there was no obstruction in the trachea. These spasms finally became so alarming in character, that in March, 1878, I performed thyrotomy. A large papilloma filled up the larynx. It extended into the sub-glottic space, and seemed to make great pressure upon the walls of the larynx. It seemed probable that this pressure was the cause of the spasm, as there was no other explanation to be found. The patient did well for the next three days, when, upon exposure, he contracted a pneumonia from which he died on the eighth day after the operation. That the pneumonia was not due directly to the operation, seems to me to be probable for the reason that, on the third day after the thyrotomy, I called and found the little fellow standing by a window, with his hands on the glass. The wind was blowing quite strongly. It was in March, and the day was decidedly uncomfortable. The patient had worn a canula so long, that the mother did not seem to recognize any new element in the case. There was no fever at the time of my visit, and the patient had a fair appetite.

This case was reported in the first volume of the ARCHIVES OF LARYNGOLOGY. It is reproduced here for the reason that it illustrates the usual symptoms of these congenital growths.

CASE 4.—On the third day of January, 1879, I was consulted in the case of a child of Mr. and Mrs. S., of Chicago. From the physician who attended the mother at the time of the birth of the

child, Dr. Adams, I learned that the voice was hoarse at birth. The cry was never natural. For some months before the time of observation, there had been almost constant dyspnœa, with spasm of the glottis. This had led another physician to pronounce the case one of croup, and when Dr. Adams was called the little one was under treatment for that disease. The parents stated that the dyspnœa had been much worse for the last few weeks. The spasms had become alarming. At the time of the examination the lips were blue, and the pulse weak and small. There was considerable emaciation, and the struggle for breath was constant. I became satisfied that there was a tumor in the larynx, though the extreme depression of the little patient deterred me from making any attempt to examine the parts with the laryngoscope. Tracheotomy was performed by Dr. Adams with the result of giving relief to the distressing symptoms. Death followed within the next twenty-four hours. The post-mortem revealed what I had expected, a papillomatous tumor blocking up the glottis, leaving only a small opening through which respiration was accomplished.

Case 5.—On the 20th of June, 1879, Mr. and Mrs. F. M. S., of Elkhart, Indiana, brought to me for examination and advice a well-grown male child, aged fifteen months. From the parents I learned the following facts: at the time of birth it had a rough, hoarse voice or cry. They likened it to the voice of a boy at the age of puberty. There was not loss of voice, but this peculiar cry was persistent, and as the child grew it became more marked. At the time of examination the general condition of the patient was good; it was well nourished, and in every other respect except the peculiar voice and the phenomena to be noticed, appeared healthy. As it amused itself with its toys it made a sort of cooing noise, like that often heard from other children in similar circumstances. The respiration was but slightly disturbed, but on careful observation the expiration was found to be a little embarrassed. On attempting to cry the voice became entirely extinct, and there was great difficulty in expiration. During sleep the breathing was not normal, the child "snored," as they stated it. Expiration was also prolonged. I diagnosed laryngeal tumor, congenital, and probably papilloma. As there were no urgent symptoms demanding immediate operative procedure, I advised that the child be taken home, and that at some future time an effort be made for the removal of the growth. If in the meanwhile the dyspnœa should become constant, I advised that tracheotomy be performed.

About the 1st of June, 1880, I received a letter from the father, living then in the State of New York, asking further advice. I quote from his letter: "Now the tumor has evidently enlarged very much; breathing is very labored, so much so that we feel alarmed lest he may suffocate. Now in your estimation, from the circumstances of which you made a record, could the tumor enlarge sufficiently since your examination to place him in a critical condition? and would you advise that the operation of tracheotomy be performed at once? The boy is now twenty-five months old." I was also asked for a reference to some physician in the East, as it was more convenient for them to take him to New York, for instance, than to bring him to me. I wrote a statement of the case as I found it at the time of my examination, and advised that they consult Dr. George M. Lefferts, of New York City. June 20, 1880, I received from Dr. L. a letter in which the further history of the case is given.

Dr. Lefferts says:—"Mr. S. brought the child to New York with dangerous dyspnœa, and urgent laryngeal spasm at night. I examined it laryngoscopically, and recognized the complete blocking up of the larynx by papillomatous growths. The child could be easily examined. I recommended tracheotomy at once, and explained to the parents the necessity of a thyrotomy at a future date. The tracheotomy was performed on the 10th of June. The child did unusually well until the 13th, when it developed the early signs of pneumonia; on the 14th, consolidation of the lower lobe of the right lung and crepitant and mucous râles over the whole of the left. Death at 10 P.M., June 14th. Autopsy, June 15th. Larynx filled by papillomatous growths, fringing the whole of the vocal cords and lying at the base of the epiglottis and the interarytenoid commissure. Only opening for the respiratory current posteriorly at the cartilaginous glottis, and very small.

"I am very sorry that I cannot communicate a better result. The case was one of great interest, the growth being probably congenital. I anticipated being able to relieve it completely by the thyrotomy. All precautions were taken after the tracheotomy to guard against lung complications, but unfortunately without avail. The case and the result of the autopsy substantiate your early diagnosis most fully."

The spontaneous expulsion of the tumor in case 2 is in-

teresting in connection with observations to the same effect made by others. I have seen three cases in adults in which the same result has followed a violent fit of coughing. I have also seen several cases of papilloma in which the patients or their attendants ascribed the growth to whooping-cough.

Discussion on Dr. Johnson's Paper.

Dr. KNIGHT said that in this connection he would like to state his own conviction in regard to the proper treatment of these papillomatous growths in very young children, in order to see how it might compare with that of other Fellows of the Association. In consideration of the gravity of the operation of thyrotomy, its great liability to permanent impairment of the voice, and the risk of the recurrence of the growth, he thought it proper in such cases to insert a tracheotomy tube when urgent dyspnœa demanded it, and then wait for a not impossible spontaneous expulsion, or until the child should become old enough for operation *per vias naturales.*

Dr. J. O. ROE said that the reading of Dr. Johnson's very interesting paper and the report of his cases recalled to his mind very vividly two cases of undoubted congenital growths of the larynx which had come under his own observation.

The first case he saw about five years ago. It was that of a child, two years of age, referred to him by Dr. Ely, of Rochester. From infancy this child had had a very hoarse, croupy voice, and was unable to cry aloud. This condition continued to increase until the child was one year old, when it began to have considerable difficulty in respiration, especially on exertion. From this period to the time Dr. Roe saw the child, the dyspnœa had not increased, and its condition had apparently remained stationary. He succeeded in making a laryngoscopical examination, which revealed a growth, evidently papillary in its nature, springing from one side of the larynx,—as he remembered, from the right side. He advised that tracheotomy be performed, but the parents preferred to defer the operation until it became more urgently called for. The case had not since been heard from.

The second case was that of a child about eight months old, which had not been able to cry aloud since birth, and had had frequent attacks of marked dyspnœa. As this condition was unassociated with any inflammatory trouble, the family physician

brought the child to Dr. Roe for, if possible, a laryngoscopical examination. After several attempts a growth was discovered in the upper portion of the larynx. It was advised that tracheotomy be performed at once, as the child was in imminent danger of suffocation. The operation was at once performed. The child recovered without accident, has worn the tube since, and is now stout and healthy. In this case he also advised that the operation of removing the growth be deferred until the child was old enough for the tumor to be removed *per vias naturales*, unless it should grow sufficiently to require operative interference before. In this respect he agreed with Dr. Knight that the operation of thyrotomy should be avoided, unless imperatively required.

Dr. COHEN referred to the frequency of "colds" in early life, and to the well-known fact that papillomas frequently followed the catarrhal inflammations of the larynx in measles, croup, diphtheria, and whooping-cough. He was inclined to believe that growths of this character that are really congenital are rare. He was opposed to the radical operation when not absolutely necessary; not so much on account of prospective injury to the voice, for that was a matter secondary to preserving the life of the patient, but he feared the cicatricial tissue of the divided skeleton of the larynx would materially interfere with the proper development of the larynx at puberty. He would also call attention to the fact indicated by the result of two operations mentioned in the paper, that they are attended by a certain risk of pneumonia. He had long recognized this risk in all operations upon the cervical region, even when the air-passage was not opened, and was inclined to attribute it in part to the lowered temperature to which the pneumogastric nerve and its ramifications were subjected. He therefore deemed it important that such operations should be performed in well-warmed apartments, and that great circumspection be used for several days after the operation.

Dr. GEORGE W. MAJOR said that a clearly congenital case of laryngeal papillomata had not come under his observation; cases, however, had presented themselves so early in life that some interest might attach to a short narration of them. The first case, a child of two years, was referred for an examination on account of aphonia and dyspnœa, in December, 1880. Active treatment was deferred until May 12, 1881, when a tracheotomy was performed. Since that date a tube has been worn continuously. In August, 1882, a quantity of papillomatous growths

were expectorated, and the voice and breathing remained fairly good for at least two months, when they gradually became interfered with. A few weeks ago an examination showed extensive redevelopment of the growth, which was above the level of the cords. Another case was that of a child, aged ten months, with a hoarse voice from infancy and occasional attacks of difficult breathing. It was seen for the first time at about its second month of life, in consultation, and not again until a few days previous to its death. A tracheotomy was then urged, but it was so long delayed that when performed life only lasted twenty-four hours. On post-mortem examination papillomatous growths were found in the larynx.

In regard to thyrotomy he considered that even at the risk of permanent injury to the voice it is a preferable operation to one through the cricoid cartilage.

Dr. W. F. DUNCAN related the history of two cases of papilloma in children under three years of age. In both, the diagnosis had been made with the laryngoscope. The parents of the first case refused to allow tracheotomy to be performed, and the child died from suffocation.

The second case was operated upon, and the tumor was removed. The child made a good recovery.

Paper.

LARYNGEAL PARALYSIS FROM ANEURISM.

BY WILLIAM PORTER, M.D.

THE indications of intra-thoracic aneurism are by no means always plain. How often does the interrogation point follow the record of the diagnosis in our case-books, and we ask help of time, that most venerable unraveller of our knotty problems!

In three cases, during the last two years, the laryngoscopic evidences were very valuable to me, and I the more readily present the histories to this Association, because in each the laryngeal symptoms were the first from which the patient sought relief.

CASE I.—M. S., æt. forty-two, railroad agent, was first seen early in 1881. His chief subjective symptoms were slight dyspnœa and

hoarseness. His voice was uncertain, at times some tones higher than natural, and often harsh and rough. Until within two months he had been in good health, excepting several mild attacks of rheumatism. The increase of voice difficulty had been gradual, and he had been under treatment for chronic laryngitis.

After the most careful examination of the chest, I could detect nothing abnormal, except a little increased bronchial respiration on the left side. There certainly was neither bruit, thrill, nor increased area of dulness.

With the laryngoscope, the left vocal cord was found to be fixed in nearly the median line. There was also some congestion, probably from the increase of effort required in speaking. During phonation the right cord was advanced beyond the median line so as to meet the fixed cord of the other side.

There was evidently pressure upon the trunk of the left recurrent nerve, destroying the function of the filaments supplying the abductor of that side. Further than this, the pressure did not completely involve the nerve, as the adductor filaments were uninjured.

The diagnosis of aneurism of the aortic arch was strengthened by the sphygmographic tracing of the left side. While on the right side the record was normal, on the left were very imperfect secondary waves,—a sloping up-stroke, and diminished impulse. This seemed to limit the site of the lesion to the transverse portion of the arch.

It is needless to narrate fully the progress of the case. In a few months the presence of aneurism could be demonstrated by direct examination. As the pressure became greater an interesting change took place in the larynx. In place of the fixation of the left cord near the median line, it gradually receded to the "cadaveric position" of Ziemssen, and the dyspnœa was relieved, though the voice became weak and at times inaudible.

The patient died, from rupture of the aneurism, in the autumn of the same year at his home in Ohio.

Case 2.—E. H., an officer, forty years old, and robust in appearance, consulted me last year on account of difficulty in speaking and shortness of breath. These symptoms had come on rather suddenly, after violent exertion, two weeks before.

There was very plainly to be seen a fixation of the left cord in the median line, with a certain diminution of tension. When resting, respiration was carried on easily, but upon exertion it be-

came more difficult. The sphygmograph gave tracings similar to those made in the preceding case, although there was absence of direct physical evidence; the diagnosis made was aneurism of the transverse arch.

So great has been the progress of symptoms, that at this date the correctness of this opinion is readily proven; the thrill, increase of area of dulness, and aneurismal bruit are all present. The laryngeal condition is but little changed.

CASE 3.—In April of the present year I saw Mr. F. J. E., a cotton-planter, æt. thirty-four, whose chief symptoms were harshness of voice and at times shortness of breath, with marked stridor. Until three months before he had been well, though fourteen years ago he had had syphilis. With the laryngoscope the right cord was seen fixed nearly in the median line, and slightly congested; otherwise I could see nothing abnormal.

Over the site of the ascending aorta there was some thrill with impulse, and a slight bruit, which was conveyed along the right subclavian, though I could not hear it in the region of the lett. An increased area of dulness was well defined. The bronchial respiration was unusually distinct over the lesion, the sounds being better conducted by the denser tissue, though there seemed to be no obstruction to respiration.

The sphygmograph showed the deviation from the normal usual in cases of aneurism. In this case, however, the record of each radial artery was altered, the change being to some extent greater on the right side where the dicrotism had almost disappeared.

This evidence and the direct physical signs led me to believe that the laryngeal paralysis was due to pressure upon the right recurrent nerve by an aneurism, and that of the ascending aorta or of the arteria innominata close to the aorta. Certainly it is not the rule to find pressure upon the right recurrent nerve from aneurism in such location. Still there was at least partial proof of the aneurism; it was either of the ascending arch or near enough to affect the circulation of both sides; and there was no other apparent cause for the laryngeal paralysis, which was of the same side as was the chest lesion. I cannot account for the paralysis except in this way; and I have thus far received no information of change in the symptoms as here given.

In the three cases reported it is somewhat interesting that in all of them the laryngeal condition was the first subjec-

tive indication of grave trouble, though in the last there was corroborative direct evidence of the thoracic lesion. In the other two there were neither subjective nor objective indications of aneurism at the first examination, except that given by the laryngoscope and sphygmograph. It is not unknown that aneurism may exist without an appreciable bruit or impulse, but both of these as well as increased area of dulness are generally present when there is lesion enough to produce pressure upon either recurrent nerve.

In all of these cases, as is generally true, the abductor filaments of the recurrent nerve were early affected; in the first, however, the abductors were afterward involved, as indicated by the change in position of the cord. The sequence of symptoms following the more complete involvement of the recurrent nerve was very interesting, especially the effect upon voice and respiration as the cord receded from the median line to the so-called "cadaveric position."

This is neither the time nor place to discuss the value of the sphygmograph in such instances as these just noted. It may not always give evidence of existing lesion, but where certain well-known deviations from the normal tracing are obtained, we have an additional, and, I believe, trustworthy aid to diagnosis. The importance of a laryngoscopic examination has been often urged by others and is fully understood.

At the close of the morning session, Dr. DeBlois exhibited some powder-blowers made after the pattern of the Davidson atomizer. This construction permitted their being held in one hand while in use, thus allowing the other hand free to hold the tongue depressor. The delivery tubes were of hard rubber, and could be turned either up or down as desired.

The Association then adjourned.

Afternoon Session.

The meeting was called to order at three o'clock, by the President.

Paper.

REFLEX AND OTHER PHENOMENA DUE TO NASAL DISEASE.

By LOUIS ELSBERG, M.D.

SOME of the phenomena connected with nasal disease which I am about to mention are not precisely reflex; but most of them are, and I consider it of advantage clinically to bring the former to your notice together with the latter.

More than twenty years ago I noticed that the subjects of rhino-pharyngeal disease, especially in case of considerable congestion and thickening of the mucous membrane, suffer peculiarly from more or less loss of memory and mental depression. This led me to the intimate vascular and nervous relations of the pituitary mucous membrane and the brain.

In 1863 a very remarkable case of chorea came under my observation :

S. Van H., a well-developed, intelligent girl, fourteen and a half years old, had for over seven months been suffering from fearful choreic movements, especially of the tongue, face, and hands. She belonged to what may be called a "catarrhal family," but until recently had herself been entirely free from the family complaint. She had two brothers and three sisters, and had always been healthier than either of these or her parents. She had passed through whooping-cough and scarlet-fever with impunity, had not had croup or measles, and began to menstruate at the age of thirteen, having been regular ever since. Nearly a year before consulting me, while sleigh-riding, the horses ran away, the sleigh upset, and she caught a very severe cold. The acute coryza had become chronic, the tip of her nose had become quite red, and the least exacerbation of catarrh produced intense sneezing fits and epistaxis. The chorea, though it came on very gradually, was greatly increased whenever she took cold, so that at such times the movements continued even during sleep.

Without giving the further details, it suffices for my present purpose to state that the chorea so obviously seemed to be influenced by and to depend upon the nasal

disease that I directed my attention exclusively to this, and that *pari passu* with the cure of this the chorea completely and permanently disappeared.

Since then, during a period of twenty years, my own experience and the recorded observations of others have shown a number of other morbid conditions to be due to nasal affections that were not previously suspected to be so caused. These are, besides 1, melancholia; and 2, chorea:

3. Reflex epilepsy.

4. Neuralgia, especially supra-orbital, headache, migraine.

5. Gastric disturbances and diseased conditions of the upper digestive tract, as reflex pharyngitis, uvulitis, tonsillary enlargement, etc.

6. Uterine disorders and affections of the genito-urinary mucous membrane.

7. Pain and disordered function of the organs of sense, especially of smell and taste, but also of hearing and sight.

8. Numerous affections of the extra-nasal respiratory tract and organ of voice, among which are especially prominent the various alterations of the speaking and singing voice, laryngeal cough, glottic spasm, and bronchial asthma.

I could relate cases of patients illustrating the different morbid conditions enumerated under these eight heads; but this is not necessary on this occasion, as those of you who have had any similar experience can contribute it, without such relation, to the discussion which to evoke is the object of this enumeration.

In speaking of Miss Van H., the choreic patient, I mentioned that the outside of her nose had become red. This redness was relieved with the intra-nasal disease. I have had a number of such cases in my practice. External redness of the nose, especially diffuse redness, often depends upon chronic nasal catarrh, a point to which Bresgen has recently publicly called attention, and which I can confirm from many years' experience.

En passant, I wish to mention the case of a man affected with chronic nasal catarrh, who was seized with the most violent fit of sneezing during every coïtus.

Finally, I wish to refer to the case of a girl between sixteen and seventeen years of age, who is still under my care for nasal disease, whose development is so retarded that most persons would suppose her to be only eight or nine years old. She has no hair either in the axilla or on the pudenda, has not menstruated, and is in every way stunted in growth. With the improvement of her nasal disease, her general health and development are ameliorating.

To account for the intimate connection between affections of the mucous membrane of the nose and cerebral affections, Dr. Jacobi, in a recent communication to the New York Obstetrical Society, drew attention to the following three points: "In the first place, the trigeminus with all its branches is subjected to direct or reflex irritation arising from the inflamed condition of the nasal mucous membrane. Secondly, the thickening of the mucous membrane in the narrow nasal passages of the child [and the same thing is more or less the case in the adult], and especially the presence of a polypus, seriously interfere with respiration, and the result is the accumulation of carbonic acid gas in the brain, particularly about the respiratory centre at the medulla oblongata. Thirdly, the lymphatic system of the nasal mucous membrane and that of the dura mater and the arachnoid membranes are in intimate relation with each other, which is so close that they can be injected from either side."

Discussion on Dr. Elsberg's Paper.

Dr. MACKENZIE emphasized the importance, and insisted upon the great frequency, of cough, as a symptom of nasal disease. Clinical observation and experimental investigation had led him to the following conclusions:

1. That in the nose there exists a well-defined, sensitive area, whose stimulation, either through a local pathological process, or through an irritant introduced from without, is capable of producing an excitation which finds its expression in a reflex act or in a series of reflected phenomena.

2. That this area corresponds in all probability with that portion of the nasal membrane which covers the turbinated corpora cavernosa.

3. That reflex acts are produced by stimulation of this area, and are only exceptionally evoked when the irritant is applied to other portions of the nasal membrane.

4. That all parts of this area are not equally susceptible to irritation, the most sensitive spots being probably represented by those portions of the membrane which cover the inferior half of the lower turbinated bone and the erectile body on the septum immediately opposite.

5. That the susceptibility to irritation varies in different individuals ; in some the slightest touch is sufficient to produce the reflex act, whilst in others it can only be produced after long-continued irritation.

That the reflex tract is limited to the above area is rendered probable by the following clinical facts :

1. That where reflex cough exists, this is the area chiefly if not solely involved.

2. That the act may be induced by artificial irritation of the diseased structure.

3. That it may be dissipated by topical applications to, or removal of, the diseased membrane.

4. That polypi give rise to reflex phenomena only when they arise from or impinge upon the sensitive area.

5. That in cases where foreign bodies, such as pins, become impacted in the above area, reflex cough will sometimes occur, which latter is not observed when they lodge in the non-sensitive parts of the nose.

Dr. Mackenzie had submitted a paper on the above subject to the Maryland Academy of Medicine, which would appear in the July number of the *American Journal of Medical Sciences.*

Dr. Roe said that the subject of reflex phenomena is a very interesting one ; the more clearly the subject is understood and the more thoroughly it is studied, the more readily will we be able to discover the cause of symptoms manifested in the derangements of one organ by disease located in another organ sometimes quite remote.

A very frequent illustration of the reflex derangement induced by nasal disease is seen in many cases of asthma. The association of asthma with nasal polypi is well known, but its association with hypertrophic turbinated tissue is quite often overlooked, particularly in those cases in which the nostrils are not greatly obstructed. By way of illustration the speaker mentioned the case

of a patient who consulted him last winter for severe and frequent asthmatic attacks to which he was subject, particularly at night. Examination revealed a mild form of chronic bronchitis, and, in the nose, considerable hypertrophy of the turbinated tissue over the inferior turbinated bone. In addition to other treatment, the hypertrophic tissue in the nose was removed, which gave almost immediate relief to the asthmatic attacks. Shortly after he was obliged to take a car trip for three days; during the whole trip he was quite free from any asthma or dyspnœa; before this time he had not been able to travel by rail, particularly at night on sleeping-cars, without suffering severely from dyspnœa, and being obliged to sit up all night and smoke to be able to breathe with any degree of comfort. Many other cases could be cited in illustration of this phenomenon of reflected symptoms from disease in the nose.

Dr. SEILER said that he had reported in the ARCHIVES OF LARYNGOLOGY two cases of reflex irritation due to nasal disease, and gave the history of a case of chorea due to turbinated hypertrophy, which was cured by the removal of the hypertrophies. He also mentioned the existence of cases which he believed to be neurotic, in which a sudden copious discharge from the nose, of a watery fluid, accompanied by sneezing, headache, and so forth, attacked the patient, and continued for some time, to disappear as suddenly as it had set in.

Dr. BOSWORTH said that Dr. Elsberg had opened in this subject a wide and most interesting field for discussion. The speaker wished to refer to but a single point; it would be better, it seemed to him, that in speaking of nasal catarrh, we should define the especial disease causing the catarrh. He had met with spasm of the glottis, for instance, as a reflex symptom in a number of cases of nasal disease, but it had been invariably due to a rhinitis atrophica, never to the hypertrophic form of the disease. In these cases the attack was of the most alarming character, and occurred in the young as well as in adults. The youngest patient was six years of age, the oldest a man of fifty-five. The spasm was entirely relieved, and no second attack occurred in any case as long as the nasal membrane was kept thoroughly moistened.

Dr. JARVIS said that a case of asthma, caused by complete closure of the nares by a deviated septum, gelatinous polypi, and turbinated hypertrophy, had come under his observation. The patient, for several years, had not omitted to rise early every

morning and seek relief in going to the window for fresh air. Removal of the abnormal tissues in a few weeks relieved the patient of the asthmatic attacks.

Paper.

ASYMMETRY OF THE NASAL CHAMBERS WITHOUT SEPTAL DEVIATION.

By HARRISON ALLEN, M.D.

THE subject of asymmetry of the nasal chambers can be considered from two points of view, viz., from that of the changes in proportion due to deflection of the nasal septum, and from that of the inequality of the chambers themselves in subjects in whom the nasal septum is straight. As the result of observation of ten examples of crania, selected from the anatomical cabinets of Philadelphia, it may be concluded that a difference in the diameters of the posterior nares can be detected. In the living subject, the writer has reason to believe that asymmetry in the posterior nares can be also discerned; and that, at least in the persons of those reporting for the relief of catarrhal affections, the number exhibiting such asymmetry is much larger than would appear from the examination of the crania alone. As the result of clinical study in this direction, extending over the last two years, the writer concludes that, in a fixed proportion of cases, nasal obstruction may be limited to one of the nasal chambers, and that such tendency to obstruction may be due to congenital causes.

It is not designed in this connection to present an elaborate description of this variety of conformation, with its clinical application, but simply to call attention to a fact which appears to have escaped observation; or, at least, to have received so little attention in the minds of observers as not to enter into questions of diagnosis or prognosis of nasal disorders. It is quite evident that imperfect nasal respiration, due to the above-mentioned cause, cannot be relieved by any operation on the septum, as these operations are at present defined; and that no operation short of drilling away the entire inferior turbinated bone will be likely to afford relief.

It is interesting to remark that in the crania exhibiting the above peculiarity, the best-marked examples were found in the skulls of idiots, in whom marked asymmetry of the cerebral fossæ was also seen. It is not at all unlikely that the real solution of the subject of congenital asymmetry without septal deflection is to be found in the peculiarities of development of the cerebral hemispheres themselves, and that the study of this subject cannot be separated from the general subject of bilaterality; that is to say, from the general subject of right and left symmetry as controlled by the nerve-centres.

Discussion on Dr. Allen's Paper.

Dr. DELAVAN said that the subject which Dr. Allen had brought to the attention of the Society in such an able and interesting manner was one which was entirely new. In his published works and his private investigation, Dr. Allen, with Zuckerkandl, had probably given more attention to the bony anatomy of the nasal fossæ than any other observer. For several years past great advances had been made in the pathology and treatment of the nasal cavities. Unfortunately, however, most investigators had begun at the wrong end of the question, and, instead of giving due consideration to the osseous structures of the nares and their abnormalities, had confined their attention to the overlying soft parts. It is simply impossible to relieve many cases of nasal obstruction, and the conditions arising therefrom, by medical treatment alone. In many instances surgical treatment is absolutely necessary to accomplish a thorough and radical result. The speaker's own investigations had been in the direction of Dr. Allen's, and he had been greatly interested and pleased by the suggestions which the latter had given. The importance of the recognition of these conditions of nasal malformation is of course evident as affecting their intelligent prognosis and treatment. Some of them he believed could only be relieved by severe surgical measures.

Paper.

ON THE RESULTS OF THE TREATMENT OF NASO-PHARYNGEAL FIBROMATA, WITH DEMONSTRATION OF SUCCESSFUL CASES, TOGETHER WITH A TABLE OF SEVENTY-FOUR OPERATIONS BY DIFFERENT SURGEONS.

By RUFUS P. LINCOLN, M.D.

IT is my desire to call attention to the treatment of a class of cases which, I believe, has never received the consideration which it deserves, but upon which I desire to elicit discussion. I refer to those growths usually called naso-pharyngeal polypi, especially those of a fibroid character, and which I prefer to designate by the term "naso-pharyngeal fibromata." The myxoma is excluded as being beyond the province of this paper, as well as those growths having their origin exclusively in the anterior nasal passages. These tumors, if not interfered with, inevitably cause great suffering and deformity, and ultimately destroy the life of the patient.

The object of treatment is, therefore, first, their thorough removal, with the destruction of all diseased tissue at the place of origin; second, avoidance, so far as possible, of accidents incident to operations of the naso-pharyngeal region; and third, to secure the result with the least external disfigurement.

To illustrate my subject, I have limited my researches to the records of cases published since 1867. The selection of this date is purely arbitrary, but it furnishes a period sufficiently long to embrace within it cases illustrating every variety of treatment, and the fertility of the surgeon's resources in his efforts to accomplish a cure. Some cases may have been overlooked, but none intentionally omitted. A great variety of methods of treatment have been advocated and practised, as will be seen by referring to the table of operations herein presented. In advance, I wish to disclaim the purpose of advocating any one method as applicable to every phase of the disease that presents itself; at the same time, I believe you will conclude with me that there are many cases which may be successfully treated by

a method simpler and safer than that usually employed by many of our distinguished surgeons.

An eminent operator, in advocating the removal of these growths through a partial excision of the upper jaw, remarks: "The operations for the removal of the naso-pharyngeal polypi, although formidable in character, are remarkably successful in their results."[1]

If we refer to the table of cases which forms a part of this paper, we find, that of twenty-eight patients treated by a section of the bones of the face, in several instances the growths returned, necessitating a repetition of the operation or the substitution of some other; and also that in eight cases, more than 28 per cent., death followed immediately or in a few days, a result suggesting a doubt as to the propriety of the above-quoted conclusion, and justifying a careful consideration of other methods which have been employed.

I have succeeded in compiling the history of fifty-eight patients, including three of my own, one of which is reported for the first time. These cases fairly represent seventy-four operations, which I have tabulated as follows:

[1] H. B. Sands, M.D., Brown-Séquard's *Arch. of Scientific and Prac. Med.*, June, 1873, p. 517.

SYNOPSIS OF TABLE OF CASES (pp. 92–109).

No. of Operations.	Number and Sex of Patients.	Age of Patients.	Operations Involving Section of Facial Bones or the Laying Open of Cicatrices Resulting from Previous Operations of this Character.	Removal by Knife, Scissors, Avulsion with Forceps, etc.	Removal by Écraseur or Ligature.	Removal by Injection or Cauterization with Chloride of Zinc.	Removal by Electrolysis.	Removal by Galvano-Cautery Écraseur. *
74	58	8 years, 2 14 " 6 15 " 6 16 " 3 17 " 5 18 " 3 19 " 2 } 31 20 " 1 21 " 2 22 " 1 23 " 2 25 " 1 26 " 1 30 " 1 } 4 33 " 1 35 " 1 39 " 1 40 " 2 } 6 41 " 1 42 " 1 45 " 1 47 " 1 48 " 1 } 5 52 " 2 54 " 1 55 " 1 Not stated, 8	No. operations, 39. No. patients, 28. No. cases in which recurrence is reported to have taken place within a year, 14. No. cases reported under observation for a year or more without recurrence, 4. No. cases in which there is no record subsequent to the operation, or a few months after, 13. No. deaths during or attributable to the operation, 8. In three other cases operation nearly proved fatal (Nos. 20, 23, and 46).	No. operations, 7. No. patients, 7. No. cases in which recurrence is reported to have taken place within a year, 0. No. cases reported under observation for a year or more without recurrence, 1. No. cases in which there is no record subsequent to operation, or a few months after, 5. No. fatal cases, 1 (No. 21).	No. operations, 12. No. patients, 11. No. cases in which recurrence is reported to have taken place within a year, 6. No. cases reported under observation for a year or more without recurrence, 4. No. cases in which there is no record subsequent to operation, or a few months after, 2. No. fatal cases, 0.	No. cases treated, 2. No. cases in which recurrence is reported to have taken place within a year, 1. No. cases in which there is no record after the discontinuance of treatment, 1. No. fatal cases, 0.	No. cases treated, 3. No. cases reported under observation for a year or more without recurrence, 1. No. cases in which there is no record after the discontinuance of treatment, 2. No. fatal cases, 0.	No. operations, 11. No. patients, 10. No. cases in which recurrence is reported to have taken place within a year, 3. No. cases reported under observation for a year or more without recurrence, 6. No. cases in which there is no record subsequent to operation, or a few months after, 2. No. fatal cases, 0.

* In this class is included one case treated by means of the actual cautery (No. 70).

I will conclude with a report of a case I treated last January by means of the galvano-cautery écraseur, with subsequent destruction of the stump with the galvano-cautery. After which you will have an opportunity to examine this patient, together with others operated upon by me some years ago by the same method.

A. H. G., (No. 74 in table,) a student, aged seventeen years, applied to me Dec. 30, 1882, for examination. He complained of inability to breathe through his nose, and stated that nine months before he had undergone an operation, while under the effects of ether, for the removal of a "polypus," having at that time the same symptoms as now. I subsequently learned from the youth's parents that the operation was suspended because of the loss of blood and the prostration of the patient, a portion only of the "polypus" having been removed, and that polypus-forceps and scissors were the instruments used. Several weeks elapsed before he recovered his strength sufficiently to resume his studies.

The patient was of healthy American parentage, but had himself been of a delicate nervous constitution, and was subject to frequent "colds." He was of studious habits, and for the previous two years had been at a boarding-school, but had often been obliged to suspend his studies on account of headaches, which had become more and more constant until the question of abandoning school had been seriously considered.

Nasal respiration was partially restored by this first operation, but gradually became more difficult, until at the end of three months it was as bad as ever; the consequent evils were again, therefore, added to his nervousness and diffidence, until his life had become a burden to himself and a source of constant anxiety to his family.

Examination: On inspecting the nostrils anteriorly I found the septum deviated to the left, and at a point about two inches from the margin of the right an obstructing mass, occupying the whole space, of a light pink color, smooth and elastic to the pressure of a probe. On attempting post-nasal rhinoscopy the post-nasal cavity was found occupied and completely filled, so as to press slightly on the soft palate, by a tumor of the same appearance as that discovered anteriorly. By manipulation they were found to be connnected and one and the same, and evidently fibrous in character. The whole mass was covered with mucous membrane,

but its inferior surface was rough and ulcerated. By means of a finger introduced through the mouth the tumor was followed to its attachment to the vault of the pharynx, mainly on the right side, by a rather large pedicle. There was no external deformity of the nose or face.

I advised the removal of the tumor by means of the galvano-cautery écraseur, and a subsequent treatment of the stump by the galvano-cautery. After some deliberation this method was consented to.

On Jan. 8th the operation was performed after the manner described by me to this Society four years ago.[1]

A looped platinum wire was passed through the right nostril into the throat and carried up behind the tumor to its attachment by means of a finger introduced through the mouth. The two free ends of the wire were then each passed through the two arms of an electrode, which was run as far as possible toward the base of the growth, thus encircling the pedicle close to its starting-point.

The patient was then etherized, and the electrode being connected with the battery, the pedicle was divided in two or three minutes without difficulty and with the loss of but a few drops of blood. The tumor was then withdrawn through the mouth. The excised surface of the tumor was about three-fourths of an inch by one inch, being oval in shape ; the mass was irregularly pear-shaped, as large as a seckel pear, and lobed where it extended into the right nostril. Nasal respiration was at once perfectly established, and the patient quickly rallied from the effects of the ether.

It seemed necessary to make but five applications of the galvano-cautery to the stump, which were done at intervals of a week.

An examination of the tumor showed it to be a fibroma. Nearly four months have now passed since the last operation, and there are no indications of a recurrence of the tumor, as you will be able to satisfy yourselves on inspection.

I am happy to be able to present to you, for a second examination, the two patients you saw at the meeting of this Association in 1879, at which time a detailed report of their cases and operations was made by me.

[1] Trans. American Laryngological Association, 1879, pp. 247–255.

You will remember the first case—J. B. J. (No. 33 in table,)—had been operated upon by me in April, 1875, eight years ago, for a large recurrent "naso-pharyngeal polypus," a fibroma. The operation was the same as that used in the case just given to you. There has been no return of the trouble.

There is an interesting feature in this case, of great practical value, to which I beg to call your attention. There was in this gentleman's right cheek, at the time I operated upon him, a tumor, which reached nearly an inch below the zygomatic arch, which continued behind it, and was evidently related to the main tumor. It has completely disappeared, and has never received any direct treatment.

It would seem that the nutrient supply to this prolongation had been cut off by the destruction of the main growth, and that in consequence this had atrophied.

The other patient, Mr. M. B., (No. 39 in table,) who was also treated by the same method in Jan., 1876, seven years ago, is even more remarkable in his history, because of his feeble condition when I took him in hand, and because of the enormous tumor that was literally splitting open his head. The growth had been twice before removed by eminent surgeons.

Here is a model in wax made by my friend Dr. Goodwillie, from a cast taken at the time of the operation, but after the bulk of the tumor had been much shrunken by electrolysis.

This tumor was also a fibroma, and there has been no recurrence.

TABLE OF SEVENTY-FOUR OPERATIONS ON NASO-PHARYNGEAL FIBROMATA BY DIFFERENT OPERATORS FROM 1867 TO 1883.[1]

Date.	Operator. Reference.	Sex.	Age.	Previous Duration of Symptoms.	Situation and Extent.	Pathological Nature.	Treatment.	Result and Subsequent History. Remarks.
July 19, 1867. (1)	Thomas Bryant. Trans. Path. Society, of London, vol. xviii, p. 107.	Male.	15	1 year.	Solid growth, three and a half by two inches, attached to base of skull, and completely filling upper part of pharynx.	Fibrous.	Écraseur, with whip-cord loop, tightened daily.	Tumor came away on sixth day. No sign of disease after operation. No subsequent history reported. Fourteen months before Mr. Bryant had attempted to remove a similar polypus, of two years' growth, with the wire écraseur. In five days wire came away without tumor, which became shrivelled for a time, but subsequently began to grow again.
July 23, 1867. (2)	D. W. Cheever. *Boston Med. and Surgical Journal*, March 11, 1869.	Male.	19	13 months.	Firm, lobulated tumor filling upper and back part of pharynx, and attached to body of sphenoid bone.	Not stated.	Resection of superior maxilla by Langenbeck's operation. Attachments divided with scissors, and point of section cauterized with strong nitric acid.	Symptoms of recurrence noticed after eleven months. Thirteen months previously an operation was performed for the relief of disease, of which this was the recurrence, and the origin of the growth dated two and a half years before that time.

[1] In attempting to make a collection of the fibromata of the naso-pharyngeal region, it has been found impracticable to include *only* those of purely fibroid character. This is due partly to a want of uniformity in the use of pathological terms by different writers; also to the fact that many of the tumors partake of a mixed character.

Were, however, the few questionable cases that appear in this table eliminated, the sum of the evidence would remain unaltered.

Date.	Operator. Reference.	Sex.	Age.	Previous Duration of Symptoms.	Situation and Extent.	Pathological Nature.	Treatment.	Result and Subsequent History. Remarks.
1868. (3)	D. W. Cheever. *Ibid.*	Male. (Same patient as above.)	20	11 months.	Tumor in same situation as above, of size of English walnut.	Not stated.	Langenbeck's operation repeated, and a small portion of inner angle, just below orbital process, removed on account of thickening. After section of pedicle, the bone thoroughly scraped.	In a recent note to the writer, Dr. Cheever states that there has been no recurrence since this operation.
1868. (4)	D. W. Cheever. *Ibid.*	Male.	41	13 months.	Both nostrils and the pharynx above the soft palate completely filled with a tumor of the size of a pullet's egg, whose anterior edge extended to within one half inch of alveolar border, and which was attached to the ethmoid and body of the sphenoid. In size and shape like a large lemon.	Fibrous.	Temporary displacement of both superior maxillæ. Attachments severed as near the bones as possible, and the remaining portion scraped away.	Operation followed by shock, and patient died from exhaustion 120 hours after operation.
1868. (5)	M. L. Thomas. *Lancet*, May 1, 1869.	Male.	18	18 months.	Tumor implanted in basilar process, stretching down to left cheek, and invading the maxillary sinus.	Fibroma.	Excision of the superior maxilla, and removal of the polypus.	No recurrence after several months.
Aug. 6, 1868. (6)	Mr. Rouse. *Lancet*, Feb. 27, 1869.	Not stated.	14	Several months.	Tumor of pharynx, extending through right nostril nearly to outlet, and attached to basilar surface.	Fibrous, and fibro-cellular.	Langenbeck's operation. Tumor seized and extracted with polypus forceps.	No record after thirteenth day after operation.
Sept. 14, 1868. (7)	Thos. Waterman. *Boston Med. and Surgical Journal*, April 8, 1869.	Male.	39	4 years.	Firm, lobulated growth, situated behind soft palate, extending into left nasal fossa, and attached to sphenoid.	Not stated.	Langenbeck's operation. The tumor cut and torn away, and the points of attachment swabbed with Squibb's liq. ferri subsulphat.	Subsequent history not given.

Date.	Operator. Reference.	Sex.	Age.	Previous Duration of Symptoms.	Situation and Extent.	Pathological Nature.	Treatment.	Result and Subsequent History. Remarks.
Oct. 12, 1868. (8)	Thos. Waterman. *Ibid.*	Male.	33	2 or 3 months.	Growth filling left half of space between base of skull and posterior nares, and having a broad surface of origin from basilar process of spheno-occipital bone.	Glandular, and partially fibrous.	Excision of left superior maxilla by Velpeau's operation. Tumor removed with scissors, and the bone from which it grew cut away. Squibb's liq. ferri subsulphat. applied to points of attachment.	No recurrence at the end of four months after operation.
Mar. 11, 1869. (9)	A. Bonnes. *Bulletin Gen. de Therap.*, Oct. 30, 1869.	Female.	25	Several years.	A polypus of four branches, weighing eighteen grammes, which filled upper part of pharynx and both nostrils (the right more completely than the left), and originated from base of skull.	Fibrous.	Ablation by means of a metallic nail attached to a thimble.	No recurrence at the end of four months after operation.
Apr. 13, 1869. (10)	H. G. Clark. *Boston Med. and Surgical Journal*, Oct. 19, 1871.	Male.	26	Not stated.	Soft tumor, of size of pigeon's egg, filling both nasal cavities and upper part of pharynx.	Fibro-cellular.	Incision, on left side of nose, through middle of lip. Tumor scraped out with finger. The bone, which was a little rough, was chiselled.	Tumor began to return two months after operation. Four years before this operation a small soft tumor had been removed with the knife. Time of recurrence not given.
March, 1871. (11)	H. G. Clark. *Ibid.*	Male. (Same patient as above.)	28	21 months.	Tumor filling whole naso-pharyngeal cavity, and pressing soft palate downward.	*Ibid.*	Incision made in old cicatrix, and the growth cleaned out as thoroughly as possible.	No record after one month subsequent to operation.
Nov. 11, 1869. (12)	Ephraim Cutter. *Boston Med. and Surgical Journal*, Nov. 22, 1870.	Female.	15	Not stated.	Two pedunculated polypi hanging down behind the soft palate from the post-pharyngeal wall, one of which was of cylindrical shape, and extended two thirds the length of the tongue.	In a communication to the writer, Dr. Cutter states that he regards the growth as recurrent fibroid, and that its origin was at the basilar process of occipital bone, more to the left side than the right.	Tumors removed by tube écraseur through the nose.	Larger growth afterward returned. (Time of recurrence not given.)

Date.	Operator. Reference.	Sex.	Age.	Previous Duration of Symptoms.	Situation and Extent.	Pathological Nature.	Treatment.	Result and Subsequent History. Remarks.
July 14, 1870. (13)	Ephraim Cutter. *Ibid.*	Female. (Same patient as above.)	15	Not stated.	Tumor occupying same position as the larger of the above.	Recurrent Fibrous.	Tumor removed by tube écraseur through the mouth. Seat of pedicle touched with nitrate of silver.	In a recent note to the writer, Dr. Cutter states that both growths subsequently recurred, and were removed in the same way at least four times. He has not seen the case for three years, when he last operated, and cannot say whether there has been recurrence since then or not.
1869 and 1870. (14)	Prof. Von Bruns. *Berliner klin. Wochensch.*, July 1, 1872. *Boston Med. and Surgical Journal*, Nov. 28, 1872.	Male.	23	2 or 3 years.	Large tumor filling entire pharynx, sending prolongation through left nostril to its anterior orifice, and pushing left eyeball outward, downward, and forward.	Fibrous.	Electrolysis. From May, 1869, to March, 1870, 130 applications.	Only a hard knot, of size of pea, remained in posterior edge of vomer. No recurrence at the end of two years after cessation of treatment. The patient had been operated on, three years before the treatment by electrolysis was commenced, with Maisonneuve's écraseur, but the growth returned.
1869 to 1871. (15)	Prof. Ciniselli. *Boston Med. and Surg. Journal*, Nov. 20, 1873.	Not stated.	Not stated.	Not stated.	Tumor occupying whole wall of pharynx, stopping left nostril completely and right nostril partially, and pushing epiglottis against base of tongue.	Not stated.	Electrolysis. Applications made every twenty days, from Nov. 20, 1869, to Oct., 1871.	At the end of the course of treatment tumor so reduced in size that only an insignificant prominence was to be seen on posterior inferior wall of pharynx. No subsequent history.
May 10, 1870. (16)	H. O. Hitchcock. Trans. Michigan State Med. Society, 1870, p. 94.	Male.	Not stated.	2 or 3 years.	Tumor weighing three ounces firmly attached to outer wall of right nostril, and along upper part of inferior turbinated bone, as well as to surface of pterygoid process of sphenoid and the septum nasi.	Fibrous.	Langenbeck's operation. Tumor removed piecemeal.	Previous efforts to remove polypus by avulsion and afterward by the écraseur had failed. In a recent note to the writer, Dr. Hitchcock states that there was no recurrence for three years after operation, when the patient died of pneumonia.

Date.	Operator. Reference.	Sex.	Age.	Previous Duration of Symptoms.	Situation and Extent.	Pathological Nature.	Treatment.	Result and Subsequent History. Remarks.
June 30, 1880. (17)	M. Verneuil. *Gaz. des hôpit.*, Aug. 9, 1870.	Male.	16	8 months.	Large polypus attached at left of base of skull, filling pharynx and sending prolongations into nasal fossa, maxillary sinus, orbit, pterygo-maxillary fissure, and, possibly, the temporal fossa.	Not stated.	Resection of superior maxilla, and one lobe of tumor after another removed.	Considerable hemorrhage; syncope; introduction of blood into air-passages; death during operation.
1870. (18)	Mr. Holmes. *Lancet*, Jan. 16, 1875.	Male.	35	4 years (?).	Tumor of pharynx hanging down behind soft palate, projecting into left nostril, and attached to body of sphenoid or basilar process of occipital bone.	Fibrous, with a few spindle-cells.	The whole of superior maxilla, with exception of orbital plate, removed, and the tumor cleared away as far as possible.	Recovery from operation rapid; but the growth recurred. (Time not stated.)
Dec. 3, 1873. (19)	Mr. Holmes. *Ibid.*	Male. (Same patient as above.)	38 (?)	3 years (?).	Large mass projecting into nose and adherent to base of skull.	Fibrous, and containing more round-cells than spindle-cells.	Cicatrix of former operation opened up and tumor taken away almost entirely. The whole of the soft tissues then gouged away from base of skull where the tumor was adherent.	No history subsequent to recovery from operation.
Nov. 26, 1873. (20)	Dr. Cabot. *Boston Med. and Surg. Journal*, Feb. 9, 1871.	Male.	40	18 months.	Polypus occupying pharynx and permeating every available part of nose. Appeared in both anterior nasal orifices and also at upper and inward part of right orbit; its entrance into orbit being from the sphenoid bone.	Glandular polypus. (Fibro-cellular.)	Nasal bones sawn in line of lateral nasal sutures, and the nose turned downward over the mouth. Tumor removed with scissors and forceps. Tracheotomy performed during operation on account of difficulty of respiration.	Patient almost collapsed after operation, but rallied and made a good recovery No subsequent history.

Date.	Operator. Reference.	Sex.	Age.	Previous Duration of Symptoms.	Situation and Extent	Pathological Nature.	Treatment.	Result and Subsequent History. Remarks.
1871. (21)	Cooper Foster. *Lancet*, May 20, 1871. *Med. Times and Gazette*, May 27, 1871.	Male.	19	Not stated.	A tumor of enormous size, the nasal portion of which was principally confined to left side. Attached to left side of external base of skull, it filled the base between greater and lesser wings of sphenoid, the orbital plate of the frontal, and cribriform plate of ethmoid, and extended from right nasal fossa, by way of sphenoid fissure, into the back of the orbit.	Made up of small fusiform cells and stellate connective tissue.	Tumor could not be circumscribed and large portions were torn away with forceps. Much of it left *in situ*.	Patient died twelve days subsequent to operation after convulsions and coma. The autopsy showed general arachnitis and circumscribed sloughing of brain. The cribriform plate of ethmoid was broken, and at the back part there was a small opening and a fracture extending forward from it.
1871. (22)	W. R. Whitehead. *N. Y. Med. Record*, Jan. 2, 1872.	Female.	Not stated.	Not stated.	A tumor of two ounces weight completely filling the posterior nares, projecting from pharynx into mouth, and attached from basilar process of occipital bone to a point as far down as the third cervical vertebra.	Muco-fibrous.	Removed by avulsion by means of the fingers.	No history after operation. Some time previously the patient had had a small polypus torn away with forceps through the right nostril.
Oct. 20, 1871. (23)	H. B. Sands. *Brown-Séquard's Arch. of Scient. and Practical Medicine*, June, 1873.	Male.	20	1 year.	Firm, elastic tumor occupying pharynx and nasal cavities (the right more completely than the left), and having a pedicle with broad attachment to base of skull. Oval in shape and measuring 2¾ inches in length, 2½ in breadth, and 1½ in thickness. Diameter of pedicle 1¼ inches.	Fibrous.	Flap in soft palate, including horizontal plate of palate bone, reflected downward. The hard palate found in part absorbed from pressure of tumor. The écraseur at first used, but the chain breaking, the pedicle was divided with scissors as close to bone as possible.	Impossible to satisfactorily detach pedicle at time of operation, and the wound in palate left open. There was profound exhaustion from hemorrhage, and the patient recovered without any bad symptoms. The tumor almost immediately began to grow again.

Date.	Operator. Reference.	Sex.	Age.	Previous Duration of Symptoms.	Situation and Extent.	Pathological Nature.	Treatment.	Result and Subsequent History. Remarks.
May 10, 1872. (24)	H. B. Sands. *Ibid.* *N. Y. Med. Record*, Feb. 2, 1878.	Male. (Same patient as above.)	20	6 months.	Large fungous-looking mass completely obstructing right nasal cavity and attached to basilar process of occipital, body of sphenoid, right pterygoid process, hard palate, and septum nasi.	Fibrous.	Partial excision of the jaw; connections of tumor divided; large part of septum and nearly all the remains of hard palate removed with forceps; the pedicle severed with galvano-cautery écraseur, and galvano-cautery applied to stump.	A small prolongation of the polypus into the sphenoidal cells was allowed to remain. Patient recovered rapidly after operation, but the tumor subsequently recurred. (Time not stated.) In Jan., 1877, removed a third time, and in March recurred again. From May to Aug., 1877, treated by electrolysis. The stump then touched with Paquelin's cautery and the patient discharged. No subsequent record.
1872. (25)	Leon Labbé. *Lancet*, Oct. 19, 1872. Aug. 2, 1873.	Female.	Not stated.	Not stated.	Naso-pharyngeal tumor, of size of small hen's egg.	Not stated.	Soft palate slit with galvano-cautery knife, and tumor removed with galvano-cautery écraseur.	Cauterizations on root of polypus with galvanic button for some time after operation. No recurrence at the end of nearly a year.
Mar. 12, 1873, to April 7, 1873. (26)	Paul Bruns. *Berlin. klin. Wochensch.*, 1873, No. 82. *N. Y. Med. Record*, May 15, 1874.	Male.	30	8 years.	Large tumor resting on arch of post pharyngeal wall, right side, and filling almost the entire fauces.	Fibrous.	Electrolysis.	Four weeks after last application no trace of tumor remained. No subsequent history.
June 18, 1873. (27)	Spencer Watson. "Diseases of the Nose," p. 439.	Male.	55	7 years.	Left nostril occupied by a firm growth, attached by broad base to anterior and upper part of outer walls, and to small portion of cribriform plate of ethmoid.	Fibrous.	Bone divided about junction of nasal process of superior maxilla and nasal bone, and root of polypus torn away with finger. The bones at upper part of cavity scraped, and strong perchloride of iron applied to surface of attachment.	Recurrence noticed in seven months.

Date.	Operator. Reference.	Sex.	Age.	Previous Duration of Symptoms.	Situation and Extent.	Pathological Nature.	Treatment.	Result and Subsequent History. Remarks.
Apr. 29, 1874. (28)	Spencer Watson. *Ibid.*, p. 441.	Male. (Same patient as above.)	56	3 months.	Soft polypus, large as hen's egg, occupying whole nasal cavity as far back as the sphenoidal cells (from which the deeper portion originated), and pterygoid processes.	Fibrous.	Nasal bones split up and portion of nasal process of superior maxilla cut away. Tumor removed piecemeal.	In two months patient died from intracranial disease; the nostrils in meanwhile having again become completely obstructed.
1873. (29)	Leon Labbé. *Lancet*, Aug. 2, 1873.	Male.	25	Not stated.	Naso-pharyngeal tumor implanted on basilar process.	Fibrous.	Soft palate slit with galvanic knife, and greater portion of tumor removed with galvano-cautery écraseur. Remaining part with scissors, and the seat of attachment cauterized with heated iron.	No subsequent history.
1874. (30)	Mr. Callender. *Lancet*, Jan. 16, 1875.	Female.	Not stated.	2 years (?).	Growth situated under orbital plate and extending along base of skull as far as vertebral column.	Fibrous (?).	Cicatrix of a former operation opened up, and the mass removed as far back as possible.	Case afterward turned out to be malignant and patient died two years after operation. Seven years before, superior maxilla resected, and a similar tumor, invading the antrum, removed. Recurrence at end of five years.
June, 1874. (31)	Berkeley Hill. *Lancet*, June 20, 1874.	Male.	16	Not stated.	Large naso-pharyngeal tumor extending outward through the pterygo-maxillary fissure and passing forward under the cheek.	Not stated.	Growth removed by temporary displacement of upper jaw.	Operation completed satisfactorily, but at its conclusion patient died on table, either from shock, loss of blood, or chloroform.
Dec. 18, 1874. (32)	James L. Little. *Archives of Clinical Surgery*, July, 1876.	Male.	40	2 years.	Tumor weighing two ounces completely filling posterior nares, projecting from pharynx into mouth, and attached from basilar process of occipital bone to a point as far down as third cervical vertebra.	Fibrous.	Preliminary tracheotomy and excision of greater part of anterior maxilla by Fergusson's operation. Tumor removed by galvano-cautery and scissors, and hemorrhage controlled by galvano-cautery.	Patient much prostrated, and early on following morning sank suddenly and died.

Date.	Operator. Reference.	Sex.	Age.	Previous Duration of Symptoms.	Situation and Extent.	Pathological Nature.	Treatment.	Result and Subsequent History. Remarks.
Apr. 26, 1875. (33)	R. P. Lincoln. Trans. American Laryngolog. Ass'n, 1879.	Male.	15	3½ years.	Elastic tumor weighing one and three-fourth ounces, inserted in vault of pharynx, occupying to a great extent the right nostril, occluding the left posterior nasal region, and sending a prolongation into right zygomatic fossa.	Fibrous.	Galvano-cautery écraseur, looped platinum wire being carried through right nostril, encircling the tumor at its base.	Subsequent to the operation, twelve applications of the galvano-cautery, (a platinum disk being used,) at intervals from four to seven days. No recurrence up to the present time. Avulsion with forceps had been previously attempted in this case, but unsuccessfully.
Aug. 5, 1875. (34)	H. Gulcke. *N. Y. Med. Record*, June 25, 1881.	Male.	15	Not stated.	Two tumors: one a large flat body, above lower edge of velum, on posterior wall of pharynx; and the other, softer and more conical, closing entrance to left nostril.	Not stated.	With the galvano-cautery écraseur the whole of the lower tumor, and the greater part of the upper, were removed.	Subsequently several attempts were made to remove the base of upper tumor with the galvano-cautery; but it was found impossible to keep the loop in position. The mass then began to grow again, and it was finally entirely scraped away with a sharp spoon. No recurrence up to last report; March, 1881.
Dec. 1875. (35)	R. C. Brandeis. *Amer. Practitioner*, April, 1877.	Female.	22	Several years.	Pear-shaped tumor one inch in length and three and three-fourth inches in greatest circumference, occluding both nostrils, filling upper part of pharynx and attached to basilar process of occipital bone.	Fibro-sarcoma.	Removed with wire of fine écraseur passed through right nostril.	Growth soon returned. (Time not stated.)
July, 1876. (36)	R. C. Brandeis. *Ibid.*	Female. (Same patient as above.)	22	Not stated.	Two tumors in same situation as above, though somewhat less in size.	Fibro-sarcoma.	An attempt to operate with écraseur having failed, the tumors were removed with double-curved scissors.	Several applications of chromic acid were made to the remaining stumps, and there was no sign of recurrence nine months after operation.

Date.	Operator. Reference.	Sex.	Age.	Previous Duration of Symptoms.	Situation and Extent.	Pathological Nature.	Treatment.	Result and Subsequent History. Remarks.
Dec., 1875. (37)	H. B. Sands. *Archives of Clinical Surgery*, Aug., 1876.	Male.	15	2 years.	Tumor of size of hickory-nut, attached to basilar process of occipital bone.	Not stated.	Exsection of superior maxilla and removal with galvano-cautery.	Growth soon returned. (Time not stated.)
May 17, 1876. (38)	H. B. Sands. *Ibid.*	Male. (Same patient as above.)	15	Not stated.	Tumor two inches in length, attached as above, and extending forward to great wing of sphenoid and downward to level of hard palate.	Not stated.	Lateral attachments divided with galvano-cautery knife, pedicle divided with bistoury, and the remaining part removed with forceps and scissors.	Recovery complete. No recurrence. (Communicated to author by Dr. Sands.)
Jan. 15, 1876. (39)	R. P. Lincoln. Trans. American Laryngolog. Ass'n, 1879.	Male.	21	5½ years.	Large tumor attached by a pedicle three and a half inches in circumference to vault of pharynx, completely filling upper part of mouth, occupying whole of left nostril, and pressing septum to the right to such an extent as to entirely occlude the right nostril.	Cavernous fibroma.	Removal with galvano-cautery écraseur; a looped platinum wire being passed through left nostril into the mouth, and carried up behind the tumor.	Seven thorough cauterizations of the stump with the galvano-cautery were made during the next four months, and there has been no recurrence of the growth up to the present time. In this case a "naso-pharyngeal polypus" first appeared in 1869, and in that and the following year it was twice removed by excision, after division of the soft palate. On account of the extreme debility of the patient electrolysis was employed for a year, (twenty-two applications in all,) as a preliminary to the radical operations by the galvano-cautery écraseur.
Feb. 1876. (40)	R. C. Brandeis and D. W. Yandell. *Amer. Practitioner*, April, 1877.	Female.	Not stated.	Not stated.	Hard mass, of size of pigeon's egg, and weighing 340 grains, occupying whole post-nasal cavity and attached to pterygoid plate of sphenoid.	Fibro-cellular.	Removal by écraseur introduced through nostril.	No recurrence seven years after operation. (Communicated to author by Dr. Brandeis.)

Date.	Operator. Reference.	Sex.	Age.	Previous Duration of Symptoms.	Situation and Extent.	Pathological Nature.	Treatment.	Result and Subsequent History. Remarks.
1876. (41)	R. C. Brandeis. *Ibid.*	Female.	Not stated.	Not stated.	Two tumors of post-nasal cavity, each about size of hazel-nut and both attached to pterygoid process of sphenoid bone.	Fibrous.	Removal by wire écraseur.	Patient subsequently treated for chronic nasal catarrh, and up to last report (time since operation not stated), no recurrence of tumor.
1876. (42)	Dr. Mason, of Providence. *Boston Med. and Surgical Journal*, May 9, 1878.	Male.	14	Not stated.	Pear-shaped polypus of pharynx and right nostril.	Fibroid.	Removal by looped ligature passed through the nose.	Tumor soon reappeared. (Time not given.)
Nov. 2, 1877. (43)	D. W. Cheever. *Ibid.* Boston City Hospital Reports, 1882.	Male. (Same patient as above.)	15	Over a year.	Oval tumor, large as pullet's egg, nearly filling pharynx, obstructing right nostril, and attached to bodies of sphenoid and right palate bones.	Fibroid.	Nose sawn down and depressed (Ollier's operation). Tumor removed, attachments scraped off the bones, and surface touched with nitric acid.	In a recent note to the writer, Dr. Cheever states that there was slight recurrence in this case, and that the patient has been lost sight of.
Sept. 2, 1876. (44)	H. Guleke. *N. Y. Med. Record*, June 25, 1881.	Male.	8	Not stated.	Tumor pressing down the soft palate and attached to posterior wall of pharynx.	Not stated.	Complete removal with galvano-cautery écraseur.	No recurrence up to last record, March 8, 1881. (Four and a half years after operation.)
April, 1877. (45)	J. J. Chisolm. Trans. Med. and Chir. Faculty of State of Maryland, 1878, p. 180.	Male.	47	5 years.	Tumor growing from base of skull and obstructing right nostril.	Not stated.	Removal by wire loop passed around base of growth and tightened daily. Tumor came away in three days.	Tumor recurred within four months.
Feb. 25, 1878. (46)	L. McLane Tiffany. Trans. Med. and Chir. Faculty of Maryland, p. 180.	Male. (Same patient as above.)	48	6 months.	Firm, pear-shaped tumor, six inches in circumference at largest part, and over three inches in length, filling greater part of posterior nares and pharynx, pressing on soft palate, resting against bodies of cervical vertebræ, and attached by pedicle to right pterygoid process and basilar process of sphenoid.	Fibro-sarcoma.	Preliminary tracheotomy. Nose separated from upper jaws and turned up over forehead, and both upper jaws temporarily depressed. Pedicle divided with Paquelin's cautery, and tumor extracted with lithotomy forceps. Chloride of zinc, in crystals, applied to the bones at seat of attachment.	The shock great, and electricity resorted to to stimulate respiration. Patient rallied slowly, but made a good recovery. In a recent note to the writer, Dr. Chisolm states that the patient died six months after this second operation from some acute chest trouble.

Date.	Operator. References.	Sex.	Age.	Previous Duration of Symptoms.	Situation and Extent.	Pathological Nature.	Treatment.	Result and Subsequent History. Remarks.
May 28, 1887. (47)	J. L. Ratton. *Lancet*, Nov. 3, 1878.	Male.	18	1 year.	Large growth, with base at least two inches in diameter, springing from body, pterygoid processes of sphenoid bone, back of pharynx, and margin of *foramen magnum*, filling left nostril, and protruding between alveolar process of upper jaw and the upper lip. A separate process attached to edges of spheno-maxillary fissure and passing into spheno-maxillary fossa. The hard palate had been completely absorbed by pressure of tumor.	Fibrous.	Preliminary laryngotomy. Skin flaps of Fergusson's operation. Nasal process of superior maxilla divided and anterior wall of antrum removed. Base of tumor cut off with whip-cord ligature.	Patient only partially rallied after operation, and died the same evening from exhaustion.
Aug., 1877. (48)	W. Roth. *Wiener med. Wochen.*, July 24, 1880.	Male.	42	Not stated.	Tumor larger than a pigeon's egg occupying upper part of pharynx, extending into both nasal fossæ (the left more occluded than the right), and attached by pedicle to base of skull.	Fibrous.	Removal with galvano-cautery through the nose, after fixation of the tumor.	No recurrence up to two and a half years after operation.
Aug. 31, 1877. (49)	D. W. Cheever. Boston City Hospital Reports, 3d Series, 1882.	Male.	21	3 years.	Hard, firm tumor in upper part of pharynx, secluding both nostrils and attached to basilar process of occipito-sphenoid bone.	Not stated.	Fergusson's incision on left side of face. Superior maxillary bone sawn across below molar bone and depressed. Tumor detached with scissors, and base cauterized with nitric acid.	Four years afterward patient remained free from trouble. In a recent note to the writer, Dr. Cheever states that there has been no recurrence up to the present time.
Nov. 7, 1877. (50)	Henry Morris. *Med. Times and Gaz.*, May 28, 1881.	Female.	16	Several years.	Tumor of large size, irregular shape, and broad base, occupying greater part of pharynx above soft palate, and blocking posterior nares.	Fibro-cellular.	Removal with écraseur.	No sign of recurrence up to last report, three and a half years after operation.

Date.	Operator. Reference.	Sex.	Age.	Previous Duration of Symptoms.	Situation and Extent.	Pathological Nature.	Treatment.	Result and Subsequent History. Remarks.
May 7, 1873. (51)	J. C. Ogilvie Will. *Lancet*, December 6, 1879.	Male.	17	2 years.	Naso-pharyngeal growth of size of small tomato, arising from base of skull; also a second tumor, of size of walnut, attached to floor of nasal fossa.	Fibrous.	Smaller tumor removed with écraseur. For removal of larger, Langenbeck's operation. Growth extirpated by avulsion and use of scissors.	No recurrence at date of last record, six months after operation.
Oct. 17, 1878. (52)	Macfie Campbell. *British Med. Journal*, Feb. 28, 1880.	Male.	54	3 years.	Naso-pharyngeal tumor extending in the mouth to the soft palate, completely blocking right nostril, and pushing septum toward left.	Glandular carcinoma of Billroth.	Fergusson's incision. Superior maxillary bone, with orbital plate, the palate bone, and part of malar bone removed.	A small sinus under the orbit remained and had to be freely incised. Six months after operation no appearance of recurrence.
Oct., 1878 to March, 1879. (53)	M. Barthelmy. *Le progrès méd.*, No. 49, 1879. Bul. et Mem. Soc. de Chir. de Paris, N. S., vol. v, p. 903.	Not stated.	14	Indefinite.	Large growth in pharynx depressing velum and obstructing the nasal fossæ.	Not stated.	Two unsuccessful attempts to remove tumor by avulsion. The velum was then divided, and nine times in the course of two months injections of five drops of chloride of zinc (sat. solution?) were made.	Growth became entirely destroyed, but at the end of six months there were signs of recurrence. No subsequent history given.
1878. (54)	D. W. Cheever. Boston City Hospital Reports, 3d Series, 1882.	Male.	15 (?)	3 years.	Naso-pharyngeal growth of size of English walnut.	Not stated.	Removal by galvanocautery.	Recurrence soon noticed.
1879 (?). (55)	D. W. Cheever. *Ibid.*	Male. (Same patient as above.)	16	Not stated.	Tumor of size of hen's egg, with broad attachment to posterior wall of pharynx, partially occluding both posterior nares, hanging well down in thorax, and arising from basilar process of occipito-sphenoid bone.	Fibrous.	Depression of superior maxilla. Attachments of tumor to bone scraped off.	In a recent note to the writer, Dr. Cheever states that there has since been no recurrence.

Date.	Operator. Reference.	Sex.	Age.	Previous Duration of Symptoms.	Situation and Extent.	Pathological Nature.	Treatment.	Result and Subsequent History. Remarks.
Feb. 6, 1879. (56)	M. Cruveillier. *Bul. et mem. soc. chir. de Paris*, April 5, 1880.	Male.	17	Over 2 years.	Large and resisting bilobular tumor occluding right nostril, filling posterior part of nasal fossa, and attached, one lobe to pterygoid plate of sphenoid, and the other to basilar process of occipital bone.	Not stated.	Palate divided in median line, and polypus extracted with forceps.	Gap in palate closed a year afterward; up to which time there was apparently no recurrence.
June 20, 1879. (57)	M. Duplay. *Archiv. gén. de méd.*, 1880, vol. i, p. 353.	Male.	14	3 years.	Hard, elastic tumor of size of chestnut (French) filling naso-pharyngeal space, and apparently implanted on basilar process by a large base.	Fibrous.	Incision through soft palate, and prolonged two centimetres in front upon vault of palate. Tumor removed with écraseur, and stump destroyed as far as possible with thermo-cautery.	Within three months manifest tendency to reproduction, and September 26th an injection of ten drops chloride of zinc (sat. solution ?) was made. Repeated twelve times, and last injection fifteen days before date of report, after an interval of four months; during which there did not seem to be any sign of recurrence.
Oct. 2, 1879. (58)	Prof. Aschenoven. *Archiv. für klin. Chir.*, 1880, xxv, p. 150.	Male.	52	Not stated.	Tumor of naso-pharyngeal space, large as hen's egg, attached by pedicle with broad base to base of skull.	Sarcoma.	Preliminary tracheotomy. Temporary displacement of both upper jaws. Tumor removed with forceps and sharp spoon.	Eight days after operation erysipelas set in, but patient made a good recovery. No subsequent history given.
1879. (59)	M. Verneuil. *Bul. et mem. soc. chir. de Paris*, N. S., vol. v, p. 830.	Male.	Not stated.	Not stated.	Naso-pharyngeal tumor of enormous size.	Not stated.	Soft palate divided, and considerable portion of growth removed with écraseur. Applications of chromic acid to pedicle then made every two or three days.	Remaining part of tumor gradually underwent softening and atrophy. Subsequent history not given.

Date.	Operator. Reference.	Sex.	Age.	Previous Duration of Symptoms.	Situation and Extent.	Pathological Nature.	Treatment.	Result and Subsequent History. Remarks.
Jan. 17, 1880. (60)	H. Guleke. *N. Y. Med. Record*, June 25, 1881.	Male.	17	Nearly 1 year.	Tumor of size of small hen's egg springing from upper wall of pharynx and occluding posterior part of right nostril. In addition, a number of small, soft bodies in pharynx, especially on right side.	Fibroma.	Removal with the galvano-cautery écraseur.	In a recent note to the writer, Dr. Guleke states that there has been no recurrence up to the present time.
Mch. 10, 1880. (61)	Henry Morris. *Med. Times and Gazette*, June 4, 1881.	Male.	14	2 years.	Tumor of pharynx descending behind soft palate and plugging posterior nares. Process of the growth extended into spheno-maxillary fossa through naso-palatine foramen and through sphenoidal fissure into cavernous sinus. Then upon side of body of sphenoid bone it reached to the *sella Turcica*; thus extending within the skull.	Fibrous.	The facial and palatal parts of superior maxilla removed, and a large mass of very hard growth dissected and wrenched away, together with part of septum nasi, to which it was firmly adherent. A considerable portion of tumor left *in situ*.	The patient, who was at the time in very bad condition, died before completion of operation.
June 1, 1880. (62)	Henry Morris. *Ibid.*	Male.	45	4 years.	Elastic tumor, chiefly attached to ethmoid, filling up whole left nostril, and extending also into right nasal cavity and extending into pharynx.	Glandular carcinoma of Billroth.	Osseous aperture made in a previous operation (not by himself) enlarged by snipping away parts of nasal bone and nasal process of superior maxilla, and tumor removed.	Growth recurred in five or six months.

Date.	Operator. Reference.	Sex.	Age.	Previous Duration of Symptoms.	Situation and Extent.	Pathological Nature.	Treatment.	Result and Subsequent History. Remarks.
Jan. 11, 1881. (63)	Henry Morris. *Ibid.*	Male. (Same patient as above.)	45	1 or 2 months.	The same as above.	*Ibid.*	Previous opening into nose enlarged by chipping away anterior border of superior maxilla, and growth scraped away as thoroughly as possible.	Subsequent history not given.
Sept. 1, 1880. (64)	C. B. Nancrede. *Phil. Med. Times*, Dec. 18, 1880.	Male.	52	2 months.	Large, irregular, and lobulated growth completely filling pharynx and left nostril, attached to base of skull; involving internal angular process of frontal bone, nasal process, and orbital plate of superior maxilla, and displacing the eye outward and upward.	Tubular epithelioma.	Fergusson's incision and removal of left superior maxilla, left malar, nasal, lateral mass of ethmoid, and pterygoid processes of sphenoid bone. Portions of tumor removed with fingers, forceps, and scissors.	The case did well, with the exception of sloughing of the cornea, two weeks after operation, from secondary implication of the nerve. Subsequent history not given.
Oct. 26, 1880. (65)	Henry Morris. *Med. Times and Gazette*, June 11, 1881.	Male.	14	2 years.	Tumor of pharynx large as small pear, with somewhat narrow pedicle, and a long, irregular branch, which probably projected into one nostril at posterior nares.	Fibrous, and fibro-cellular.	After two unsuccessful attempts to remove with écraseur, tumor extracted by avulsion, with forceps, through the mouth.	No recurrence up to eight months after operation.
Nov. 17, 1880. (66)	M. Desprès. *Bul. et mem. soc. chir. de Paris*, May 5, 1882.	Male.	18	2 years.	Large naso-pharyngeal tumor implanted on a large surface at base of skull, with one prolongation into right orbit, and a second, large as an apple, into zygomatic fossa.	Not stated.	Removal of superior maxilla by Nélaton's operation. Tumor extracted, and the bone at seat of attachment scraped. Orbital prolongation not entirely removed.	Growth began to recur within a month. A year previous to operation the soft palate had been divided, and interstitial injections of chloride of zinc made, but in spite of this the tumor had continued to increase in size.
Dec., 1880, to Jan., 1882. (67)	M. Desprès. *Ibid.*	Male. (Same patient as above.)	18	1 month.	Tumor growing from pedicle of above.	Not stated.	For fourteen months growth cauterized at intervals with a saturated solution of chloride of zinc.	In two months tumor ceased to grow, but the applications had been kept up for a year longer, and it was proposed to continue them for several months still.

Date.	Operator. Reference.	Sex.	Age.	Previous Duration of Symptoms.	Situation and Extent.	Pathological Nature.	Treatment.	Result and Subsequent History. Remarks.
1881. (68)	George A. Peters. *N.Y. Med. Record*, July 23, 1881.	Male.	17	18 months.	Elastic tumor, extensively attached to basilar process of occipital bone, occupying posterior nares, projecting forward into both nostrils, pushing uvula forward and downward, and encroaching somewhat upon throat.	Fibroma.	Maisonneuve's operation for removal of upper jaw, and extraction of tumor.	Growth recurred within very few months.
July, 1881. (69)	Charles McBurney. *N.Y. Med. Record*, March 4, 1882.	Male. (Same patient as above.)	17	Not stated.	Growth in same situation as above, but rather larger.	Fibroma.	Same operation as by Dr. Peters, with exception of removing the portion of bone.	Tumor recurred very quickly.
Au'mn of 1881. (70)	George A. Peters. *Ibid.*	Male. (Same patient as above.)	17	Not stated.	Tumor much the same as above.	Fibroma.	Destruction of growth by burning down with actual cautery, which was applied seven or eight times, at intervals of two or three weeks.	Each time after the cauterization the growth seemed to recur from less space. In a recent note to the writer, Dr. Peters states that the polypus is now growing slowly, and that it has involved parts which make further operation impracticable.
Dec., 1881. (71)	F. H. Hooper. *Boston Med. and Surgical Journal*, Aug. 24, 1882.	Male.	23	1 year.	Large, smooth tumor, completely filling posterior nares, and occluding right nostril.	Fibrous.	Complete removal with Jarvis' snare.	In a recent note to the writer, Dr. Hooper states that he has seen the patient within six months, and that there has been no recurrence. In 1877 he was treated for post-nasal tumor by Dr. F. I. Knight with the galvano-cautery by puncturing. After a few sittings, growth diminished in size, but subsequently recurred, and in 1879 a considerable portion of tumor was removed by Dr. Garland, through anterior nares, with forceps.

Date.	Operator. Reference.	Sex.	Age.	Previous Duration of Symptoms.	Situation and Extent.	Pathological Nature.	Treatment.	Result and Subsequent History. Remarks.
1882. (72)	R. F. Weir. *N. Y. Med. Record*, June 3, 1882.	Male.	8	1 year.	Tumor $1\frac{3}{4} \times 1\frac{3}{8} \times 1\frac{1}{2}$ inches, weighing over half an ounce, attached to basilar process of occipital bone, partially occluding the nostrils, and hanging down nearly to base of tongue.	Fibro-sarcoma.	Nélaton's operation. Soft palate divided, and a large part of hard palate, together with vomer, removed. During operation, tracheotomy performed, on account of sudden asphyxiation. Attachments of tumor cauterized.	The child rallied at first, but then suddenly sank, and died within an hour after operation.
May 27, 1882. (73)	George F. Shrady. *N. Y. Med. Record*, Sept. 16, 1882.	Male.	14	4 years.	Tumor filling superior vaults of nose and pharynx, entirely occluding left posterior naris, extending across septum into right posterior naris, and attached to basilar process of occipital, to the sphenoid, and to the adjacent temporal bone. To the left it spread to a slight extent into pterygoid fossa, and was continuous with a tumor in the cheek by a prolongation into left spheno-maxillary fossa. A lobe of tumor also extended into cavity of antrum, through an opening made in posterior surface, by absorption.	Fibro-sarcoma.	Preliminary laryngotomy. Fergusson's incision, and lower half of left upper jaw removed. Soft palate divided, and tumor removed by cutting attachments with curved scissors.	Patient died within an hour after operation. At the autopsy a tumor, of size of horse-chestnut, evidently continuous with naso-pharyngeal growth, found attached, by inflammatory adhesions, to under surface of left middle lobe of cerebellum.
Jan. 8, 1883. (74)	R. P. Lincoln.	Male.	17	2 years.	Elastic tumor of size of seckel pear, occluding both nostrils posteriorly, extending into right to within two inches of anterior orifice, and attached to basilar process of occipital bone, and to sphenoid, principally on right side.	Fibroma.	Galvano-cautery écraseur, passed through right nostril, as in cases Nos. 33 and 39.	Five applications of galvano-cautery to stump at intervals of one week. No recurrence up to present time.

Discussion on Dr. Lincoln's Paper.

Dr. JARVIS said that last year he removed a large myxo-fibroma from the nares of a young man. The tumor was attached above the left post-nasal arch. It projected forward into the left anterior naris, extended for some distance into the right nasal cavity, and almost completely occluded the entire naso-pharynx. He operated twice, removing the entire growth. His écraseur was employed. Although the severe strain bowed the instrument, the patient only complained of a toothache and the tedium of the operation. He carried the loop around the growth through the pharynx, afterward bringing the wire through the nose. Four hours were occupied by the operation, and although the instrument pulsated like an artery, there was no blood lost. Four months after the operation there was not a vestige of the growth to be seen. The division of the tumor through its densest portion, without pain and hemorrhage, demonstrated a safe and easy method for removing large nasal-fibroid tumors piecemeal, without resorting to the more formidable operations of general surgery.

Dr. A. H. SMITH described a case in which he had removed a fibroma springing from the vault of the pharynx, and having a length of between two and three inches, and a thickness of one inch. The instrument employed was the Jarvis snare, the wire being passed from the mouth out through the anterior nares. The wire broke at the last moment, but strangulation had been effected and the growth afterward sloughed. A subsequent operation became necessary a few weeks later, on account of the rapid growth of the pedicle. After the second removal the stump was touched three times a week with perchloride of iron. There is now, four weeks later, only a small papule remaining to indicate the location of the pedicle.

Dr. SEILER said that he had seen a number of cases of the kind referred to by Dr. Lincoln. In one patient the posterior nasal chambers were blocked up by the growth, which he could recognize with the finger as having undergone cartilaginous changes. He had succeeded in removing the tumor with a wire snare, and had afterward applied the galvano-cautery. Although he was told by the patient that the growth had been removed about nine months before, he had not seen, since the last operation, any evidence of recurrence. In another case he had great trouble in applying the snare, as the loop slipped off again and again. He finally, in the course of several weeks, removed the growth piece-

meal. It weighed over four ounces. Another patient, an old man seventy-four years of age, had come to him for treatment, but as he was from the country, he was obliged to let him go to a hospital. However, he removed a portion of the growth, which enabled the man to breathe more freely, and he had no doubt that eventually he could have removed it entirely by the method which was successful in the preceding case. The attending surgeon at the hospital attempted to remove part of the maxilla two days later, but the patient died while on the table.

Dr. INGALS had operated upon three cases of this kind during the last two years, although in only one was the character of the growth determined by microscopic examination.

In this case he had removed it with the galvano-cautery, and the tumor did not return, though, at the end of two years, there was a small swelling at the seat of the original growth. It was not very large, however ; about the size of an ordinary black walnut, one and a quarter inches in diameter. In a second case he had great difficulty in surrounding the base of the tumor, which filled the naso-pharyngeal space and could be seen below the palate, with the wire of the écraseur. He found it impossible to introduce a wire through the nostril, either by the Eustachian catheter or by Bellocq's sound, but finally succeeded with the aid of a soft catheter which was forced through the slight opening, while the stilette was slightly withdrawn so as to leave about half an inch at the end very flexible, while the remainder of the instrument was kept firm. He had used the handle of Shurley's galvano-cautery, as modified by Bosworth, the wire having been passed through a tubular electrode, as indicated by the author of the paper, but upon turning on the current he found it short-circuited through the metallic axis of the ivory wheel used for tightening the wire. By substituting a lead-pencil for the wheel, he succeeded in removing the growth close to the vault of the pharynx, to which it was attached ; however, he thought that it had been cut off too rapidly, as there was excessive bleeding, which was stopped in about thirty minutes. He learned from the attending physician that the patient fainted two or three times during the evening after the operation. There had been little or no complaint of pain during the operation. Although the tumor was removed perfectly it had since rapidly grown.

Dr. BOSWORTH thought that the Association owed a debt to Dr. Lincoln for bringing before it this splendid series of cases, successfully treated, without resorting to the severe operation of

Langenbeck, generally followed by surgeons. He felt personally indebted to him for the superb demonstration.

He would like to say that he had heard during the discussion about myxo-fibroma, fibroma, and polypi, and he would like to understand what was meant by these terms. According to his opinion a fibroma is never a polyp, and a polyp is never a fibroma.

Dr. SMITH asked permission to call attention, in the use of the galvano-cautery écraseur, to the great advantage of drawing the temper of the wire for several inches at its ends, for the purpose of facilitating subsequent manipulation.

Dr. LINCOLN, in closing the discussion, said that he had nothing to add to what had been stated in the paper. He simply wished to bring these cases before the Association, and to call its attention to a plan of treatment in preference to the ordinary one of excision through the facial bones. The operation which he proposed is much safer than the old one, from which nearly one third of the cases died, as shown by the statistics for the last fifteen years. Some of the speakers had referred to the difficulty in attaching the wire over these growths; it is true that it requires some patience and perseverance, but with these all its difficulties can be overcome.

The President introduced to the Association Dr. Holden, who exhibited an illuminating apparatus for examining the upper air-passages, which he had devised in the laboratory of Mr. Edison.

Dr. HOLDEN said that he regretted that he had to exhibit the instrument while it was still in an imperfect state, but he would show that he had been successful in adapting the carbon illuminator to a glass tube for the purpose of illuminating cavities of the body. The instrument which he exhibited was a glass tube enclosing the carbon filament, and covered by a shield for the greater portion of its extent. It worked well with a small power, only two Smee cells being required. The principle is simply that of direct illumination of the cavity itself, without the use of a mirror. The defect in the instrument was, that the shield did not extend far enough forward. The glass tube was larger than necessary, but was made so in order that it might not heat up and become uncomfortable to the patient. He felt much encouraged at its success as an illuminator.

The President stated that directly after the close of the meeting Dr. Lincoln had some cases which he would exhibit.

The session then adjourned.

Third day, morning session.

The President called the Association to order at 10 o'clock.

Paper.

A CASE OF THYROTOMY FOR MORBID GROWTH, WITH SUBSEQUENT DEVELOPMENT OF EPITHELIOMA IN THE CUTANEOUS CICATRIX, BUT WITHOUT INVOLVEMENT OF THE INTERIOR OF THE LARYNX.

By J. SOLIS-COHEN, M.D.

Mr.——, æt. sixty-three, a practising attorney in one of the Southern States, was referred to me, June 23d, 1880, by Prof. D. Hayes Agnew, of the University of Pennsylvania, on account of a persistent hoarseness of some two years' duration, which had steadily increased in severity and had disabled him from pursuing his professional avocations. His general health was considerably impaired, though he was still quite vigorous, and his voice was a husky laryngeal whisper.

On laryngoscopic inspection, a sessile morbid growth, of about the bulk of a common white bean, was seen attached to the anterior portion of the right ventricle of the larynx, and apparently attached to the vocal band likewise, which it overlapped to a considerable extent. There was general catarrhal inflammation of the larynx. The inception of the disease was attributed by the patient to over-use of his voice while suffering with sore throat.

The location of the growth, its general aspect, and the age of the patient, aroused a suspicion that it might be an epithelioma, and I declined to institute any immediate intra-laryngeal measures; the more so that I feared tampering with even a papilloma in that situation might irritate it into malignancy.

The result of the consultation with Prof. Agnew, was that the patient was sent to Newport, for a month, to recuperate, and placed meanwhile under the medicinal influence of arsenic, iron, and strychnine.

On his return the tumor had so increased in size as to strengthen my opinion as to its malignancy, and on July 24th, with the assistance of Drs. Agnew and Seiler, I divided the larynx externally and extirpated the neoplasm from the vocal band by direct access.

Microscopic examination, by Dr. Seiler, determined the growth

to be papillomatous, and I experienced the mortification of having possibly performed a needless operation.

The thyroid cartilage was ossified and required the use of strong bone-forceps for its division, and the section was attended with considerable comminution of bone, leaving irregularly spiculated edges. Recovery was prompt, however, though complete union was somewhat retarded by the fractured nature of the section of the thyroid cartilage; and on the fourteenth day the patient was able to attend at my office.

The external wound healed kindly. The anterior portions of the vocal bands became adherent, web-like, as so frequently follows the operation of thyrotomy, and the ventricular fold became adherent to the vocal band at the point from which the tumor had been removed. The voice was shrill.

On September 8th, and upon three subsequent occasions within the week ensuing, I divided the web with the galvano-caustic blade, and the vocal bands remained separated; the right band, which was adherent to the ventricular fold, remaining on a higher plane, and thus impairing the voice so that it was as bad as before the operation. Despite all that I could do I had to submit to a second mortification in permitting my patient to return to his home without a voice fit for work. I felt convinced, however, that vocal power would be restored by exercise, and urged daily systematic attempts at vocalization, at stated intervals. Within a couple of months I heard by letter that the voice was steadily improving, so that the patient was enabled to resume chamber practice; and at the meeting of the American Medical Association at Richmond, May, 1881, the patient met me for examination, and greeted me with a sonorous voice, with which, he told me, he had for some time been able to argue cases in court.

Laryngoscopic examination showed the ventricular fold, at the site of the disease, somewhat adherent to the vocal band near its anterior portion, which it covered in great measure. The larynx was slightly congested. There was no appearance of morbid growth, and no adhesion at the anterior commissure of the vocal bands. In phonation the ventricular fold of the wounded side overlapped the vocal band so thoroughly as to conceal it almost entirely from inspection. The external cicatrix had contracted considerably, but presented a very healthy appearance.

I saw the patient at my own home a fortnight later, and again in November of the same year. His voice was excellent, and he

reported himself as hard at work in his profession, and troubled only with occasional symptoms of superficial catarrhal laryngitis.

On May 30th of the following year (1882), the patient presented himself with a small subcutaneous nodule, the size of a cherry, over the right wing of the thyroid cartilage, which had been noticed for the first time some ten days before, and which was growing rapidly. It appeared as though attached to the cartilage, being immovable upon it. As I was to start next day for Saint Paul, to attend the meeting of the American Medical Association, I requested Prof. Agnew to remove it ; which he did on June 2d, with the aid of our fellow-member, Dr. C. E. Bean, my office assistant. It was found not to be adherent to the cartilage. Recovery was prompt, and the patient soon returned to his home. Dr. Formad, of the University of Pennsylvania, examined the tumor microscopically and pronounced it a tubular epithelioma.

On August 16th, or ten weeks later, the patient again presented himself to me with a fresh nodule, the size of the kernel of a small almond, over the left wing of the thyroid cartilage. It was freely movable and was not connected with the cartilage. Its presence had been noticed but three days before. The old cutaneous cicatrices were very much puckered, and the last wound made for removing the previous nodule had a pin-point opening at its centre, with a minute irregular zone of fungous granulations, such as is seen in cloacæ leading from dead bone. I removed this nodule, which was found attached to the posterior surface of the sterno-thyroid muscle, closely bound down by connective tissue. On the second day the patient was able to attend at my office. This tumor was found by Dr. Formad to be another epithelioma.

As the wound of the former operation resisted healing, and the whole character of the skin around presented a very suspicious appearance, I determined to remove the entire cutaneous mass and replace it by flaps from the breast. Calling in the assistance of Dr. R. J. Levis of the Pennsylvania Hospital, who has a special skill in plastic surgery, we removed the parts very extensively, including all the connective tissue down to the thyroid cartilage ; and replaced them with a pair of flaps from the chest. The skin removed was found infiltrated with epithelioma.

The junction of the two wings of the thyroid cartilage was in excellent condition and showed no evidence of the rough usage to which it had been subjected in its section with bone-pliers.

The right ala was soft at the point from over which the first

epithelioma had been removed ; probably as the result of pressure. It was thoroughly scraped, almost to the inner surface. The propriety of removing this wing of the cartilage was discussed by Dr. Levis and myself, but we thought it best to leave matters as they were.

The new flaps united kindly. The parts from which they had been transplanted steadily filled in with granulations, and became nicely covered. But before the patient left the city, some five weeks after the operation, a fistulous tract opened about the lower portion of the central wound ; exposing a sinuous passage leading toward the spot where the cartilage had been scraped. A counter-opening was made at this point, and a seton of india-rubber was introduced and tied in front, in the hope of exciting adhesive inflammation from below upward, to obliterate the sinus. This hope was never realized.

One month later the patient returned with a fistulous opening in the left flap, at its junction with the right, surrounded by a fresh mass of fungous granulation. During all this time the interior of the larynx remained healthy and the voice was good. There was no recurrence of intra-laryngeal growth.

The patient's general health now showed signs of serious impairment, and his family were made aware of the serious nature of the case, and its probably approaching termination. The patient was dissuaded from his object of undergoing another operation, and returned home to await results. I did not see him after this interview.

Early in January of this year I was informed of the patient's death. His own physician having removed his residence, he came under the care of a gentleman who had not previously been professionally connected with the case. In response to my inquiries as to the deportment of the case toward its close, this gentleman kindly wrote me.

" May 10, 1883.

" Your letter received, and would have favored it with a more prompt reply, but was absent from home. Commencing *in medias res :* I was Mr. ——'s physician about forty days prior to his death. When first seen, general appearance fairly good, slight cachexia ; voice unaltered and remained so to the last except from exhaustion. External appearance of tumor : about four inches in diameter, nodulated, indurated, and apparently semi-

cartilaginous formation. Enlarged on right side, smoother and not so large on left. A small sinus on right, through which cricoid cartilage could be felt entirely denuded. The wound proper was closed with a sphacelous centre, or plug (which never detached itself), surrounded by a denuded surface one inch on either side, studded with exuberant granulations. The wound from which flaps were taken healed. Appetite good up to about fifteen days, after which began to decline. Emaciation followed. Cachexia intensified. Brain active up to about five days, when a stage of indifference succeeded, further followed by a comatose condition from cachectic toxæmia. Sank in that condition. I send you a pencil sketch which may give you a clearer idea."

This case, apart from its special interest laryngologically, illustrates, etiologically, the development of epithelioma from the products of local irritation.

Discussion on Dr. Cohen's Paper.

Dr. COHEN said that his impression was that the epithelioma occurring in the cicatrix might have been caused by an irritation due to the friction of the patient's neck-band. It might also have been due to the sharp spiculæ of bone which were set free at the first operation ; although that portion of the thyroid cartilage exposed in the plastic operation was smooth, and presented no indication of having suffered any injury. He looked upon this case as an example of a malignant growth, the direct outcome of local irritation.

EXPERIMENTAL RESEARCHES ON THE TENSION OF THE VOCAL BANDS.

(*a*).—THE ACTION OF THE THYRO-CRICOID MUSCLE.

(*b*).—THE ACTION OF THE EXPIRATORY BLAST OF AIR.

By F. H. HOOPER, M.D., Boston,

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THE experiments recorded in this paper were performed in the physiological laboratory of the Harvard Medical School, in conjunction with Professor Henry P. Bowditch.

The diagrams and figures contained in the text were reproduced from the original tracings and drawings by the photo-electrotype engraving process.

(*a*).—THE ACTION OF THE THYRO-CRICOID MUSCLE.

Although the literature pertaining to the function of this important tensor—commonly but incorrectly called the crico-thyroid muscle—is not extensive, it furnishes us with every possible variety of opinion. The muscle is usually described as arising from the front and lateral part of the cricoid cartilage; its fibres pass upward and outward, diverging slightly, and are inserted into the inferior and inner border of the thyroid cartilage from near the median line in front, and as far back as the anterior border of its lower cornu. Its nervous supply comes principally from the external branch of the superior laryngeal nerve.

The observers who have directed their attention to its action may be divided into six classes:—

I. Those who hold that it tilts the thyroid cartilage downward and forward on to the cricoid. (This is the generally received theory in regard to it, and is the view expressed in such standard works of anatomy and physiology —with the exception of the ninth edition of Quain, which has only recently appeared—as Galen, Casserius, Gray, Hyrtl, Henle, Meyer, Meckel, Hartmann, Cruveilhier, Sappey, Morel et Duval, Carpenter, Huxley, Todd and Bowman, Foster, Hermann, and others; and among laryngologists, Türck, Stoerk, Mackenzie, Schrötter, and Seiler.)

II. Those who affirm that it draws the cricoid up on to the thyroid. (Cowper, 1724; Magendie, 1813; Lauth, 1835; Bishop, 1839; Longet, 1841; Cuvier, 1846; Harless, 1853; Battaille, 1861; Fournié, 1866; Jelenffy, 1873; Schech, 1873; Schmidt, 1873; Milne Edwards, 1876; Cohen, 1880; Elsberg, 1882; Quain's Anat., 9th ed.)

III. Those who maintain that it draws both cartilages together by its contraction, the predominance of movement being in the thyroid. (Vesalius, Merkel, Theile, Béclard, Harrison.)

IV. Those who assert that its action is according to the fixation of the cartilages; that when the cricoid is the point fixed, the thyroid is the one moved, and *vice versâ*. (Budge, Riegel, Mandl.)

V. Those who insist that instead of drawing the cartilages together, its function is to retain them in a fixed position when separated. (Vierordt, Luschka.)

VI. The sixth class is purely of historical interest. Brown (1683) stated that "when the muscle is contracted, it extends the cartilage cricois, or annularis, and so openeth its cleft for a more deep and greater voice or sound." Dionis (1695) considered that its action was to dilate the sides of the thyroid, thereby enlarging the glottis. Haller (1766) agreed with this view, but thought also that it approximated the two cartilages.

But one explanation can be offered to account for these conflicting theories. Except in the case of four observers (Magendie, Longet, Schech, Schmidt), the above hypotheses were not founded upon experimentation. They

are mere speculations unsupported by reliable experimental proof. And it is a significant fact that the four observers named—the only ones who substantiated their opinions by experiments upon animals—all agree concerning the action of the muscle.

Magendie in 1813 not only gave a very clear description of the distribution of the laryngeal nerves, but he was the first, by experimentation, to observe and record the true action of the thyro-cricoid muscle. He fails to tell us upon what animal he made his observation, and contents himself with saying: "Quand on enlève la peau du col, de manière à apercevoir l' intervalle crico-thyroïdien, on a lieu de se convaincre que dans la produetion des son aigus, et surtout à l' instant de la déglutition, le cartilage cricoïde s' élève au point que son bord supérieur s' engage sous le bord inférieur du cartilage thyroïde."

We find mentioned, however, in Cowper (1724), that the function of the muscle "is to pull up the annularis rather than to bring down the scutiformis."

Our own experiments, performed in a different manner from any hitherto recorded, result, we think, in definitely determining the chief effect produced upon the cartilages by the contraction of the muscle. They prove the accuracy of Magendie's early observation, and force us to reject the theory, so generally accepted, that the thyroid cartilage is drawn down by its influence. The dogs used in the investigations were prepared as follows:

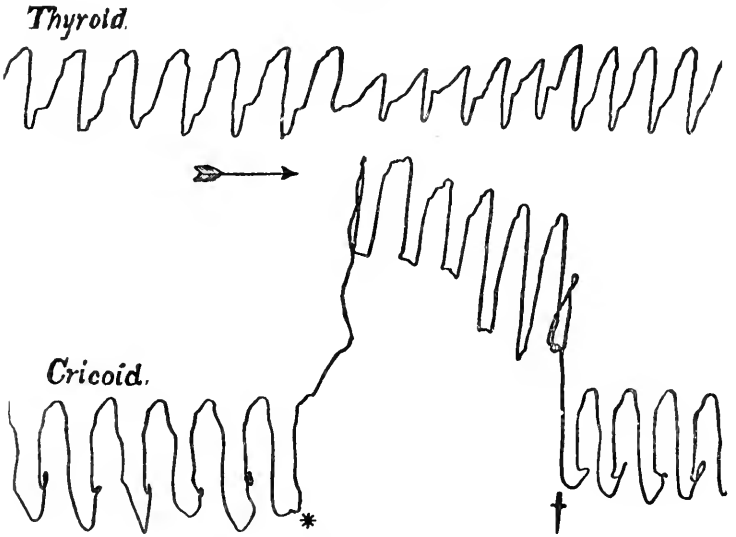
The animal being thoroughly etherized and secured to a dog-holder on a table, both superior laryngeal nerves were exposed and placed on shielded electrodes. The nerves were tied just above the electrodes, in order to prevent reflex stoppage of the respiration on irritation. The thyroid and cricoid cartilages were next exposed without disturbing any muscular attachment. Two levers, twenty-eight centimetres in length, composed of ordinary straw, and terminating at one end in a strong pin, were stuck into the centre of each cartilage. The farther end of each lever, being tipped with a delicate metallic point, was so arranged as to record graphically on a smoked paper of a revolving

cylinder the movements of the cartilages produced by irritating the superior laryngeal nerves.

Stimulation was produced by a rapid succession of induction shocks from an apparatus graduated empirically by Fick's method. The graduation was such that an intensity of 1,000 corresponded to the stimulation produced when a secondary coil of 10,260 turns of fine wire was pushed wholly over the primary coil. After repeated trials, it was determined that an intensity of fifteen was the most applicable to the purpose, and this intensity was, therefore, employed in all the experiments.

The tracings are to be read from left to right. The asterisk denotes the beginning of the stimulation, the dagger the end.

Fig 1

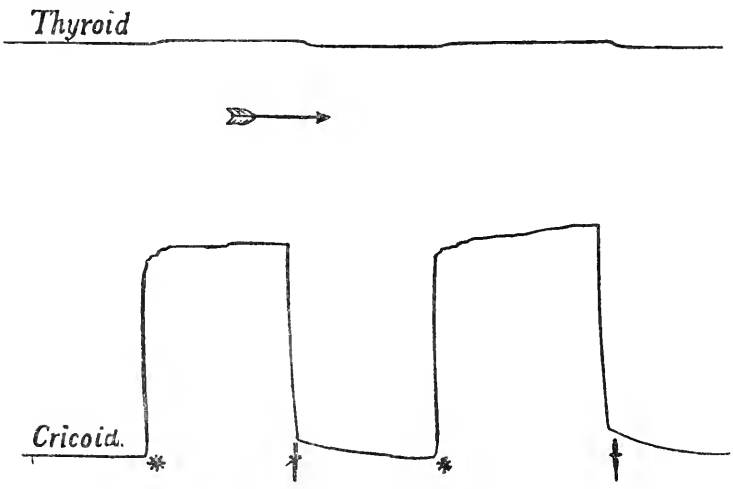


DOG ETHERIZED; SUP. LARYNGEAL NERVES TIED.

The undulations of the above tracing in fig. 1 represent the respiratory movements of the larynx. At the point of stimulation, it will be noticed that the cricoid cartilage was drawn up toward the thyroid, as indicated by the marked rise of the cricoid curve. As soon as the irritation ceased, the lever immediately fell to its previous level. No up-

ward or downward movement of the thyroid, however, can be observed. The respirations are somewhat shortened during the stimulation, but the recording pen attached to the thyroid cartilage remains on the same level throughout the experiment. The next experiment, performed after the dog had been killed by section of the medulla oblongata, yields the same result.

Fig 2



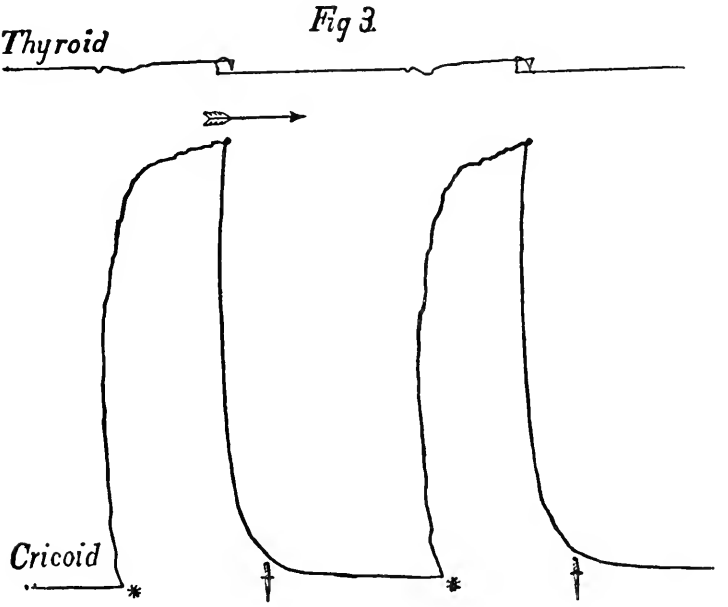
DOG ; MEDULLA DESTROYED.

In this figure (2) it will be noted that, respiration having ceased, the pens trace a straight line. As in the previous experiment (fig. 1), stimulation of the nerves caused the same rise of the cricoid, while no appreciable effect was produced on the thyroid. The minute elevations in the thyroid line, at the points of irritation, were probably accidental, as will be explained hereafter. The following experiment was performed on a different animal, but under similar conditions as the preceding.

Here (fig. 3) the same effects as in the foregoing experiments are evident, only more pronounced, the rise of the cricoid being very powerful. The undulations in the thyroid line will be readily understood when we consider what an infinitely small amount of movement of the cartilage would be

sufficient to produce a change in a flexible pen at the end of a lever of the length used in these researches. Indeed, it is surprising that there is not more oscillation, for, the thyroid not being absolutely fixed, the contraction of the muscle would necessarily cause enough motion to account for the slight unevenness of the thyroid lines. But that there is no positive movement imparted to the thyroid by the action of the muscle seems beyond doubt.

Fig 3.



DOG ; MEDULLA DESTROYED.

These experiments were repeated many times, on the same and different dogs, always with confirmatory results. A dissection was made subsequently in every instance, in order to be sure that the electrodes had been on the superior laryngeal nerves,—a necessary precaution in such investigations.

We by no means submit these researches as establishing the entire function of the thyro-cricoid muscle ; inasmuch as this, like all the intrinsic muscles of the larynx, has the important characteristic of being arranged or divided into bundles

of fibres. Under what conditions these bundles act, how they act, whether they can act separately or only jointly, is as yet undetermined. Nevertheless, the salient point clearly demonstrated by our experiments is, that the principal effect of the contraction of the muscle is to draw the anterior portion of the cricoid cartilage up on to the thyroid, the latter remaining practically fixed. The posterior plate of the cricoid, with every thing attached to it, being, therefore, rotated downward and backward, the bands are necessarily stretched. It would be beyond the scope of this paper, besides leading us into the field of speculation, to discuss the probable working of the different bundles of the muscle. But it is not improbable that the vocal bands, being stretched in the first place in the manner described, the oblique bundles may then, in their turn, come into play, and increase the tension by pulling the cricoid cartilage directly backward. When we bear in mind that (with the exception of a small part of the inferior constrictor) not a single extrinsic muscle is attached to the cricoid cartilage, and reflect upon the mechanical construction of the larynx, it is difficult to comprehend by what mechanism it can possibly be fixed in a sense that would permit the thyroid to be pulled down upon it. Nature, doubtless, never intended that it should be. On the contrary, its extreme mobility is one of its most striking and distinguishing characteristics. In vocalization the thyroid cartilage, steadied by the powerful extrinsic muscles inserted into it, may be regarded (as compared to the cricoid) as the passive agent, while the latter, owing to the manner in which it swings upon the short processes of the thyroid behind, and to the elasticity of the parts in front, and to a certain extent on the sides, is permitted to play upon it with every delicacy of adjustment through he agency of the intrinsic muscles of the larynx attached to it, and of another force presently to be alluded to. Indeed, were it not for this free and unrestrained movement of the cricoid cartilage on to the thyroid, the marvellous capabilities possessed by certain phenomenal voices would be impossible. For to it the stretching of the vocal bands is, in a great measure, directly due. When we are

told,[1] by J. Solis-Cohen, that a certain singer, with a compass of three octaves, was capable of effecting as many as two thousand one hundred changes of pitch, and "that the variation of tension between the tones that she could produce would represent a successive lengthening and shortening of the vibrating edges of the vocal bands in successive proportions of one seventeen-thousandth of an inch," we are simply lost in astonishment. It is therefore interesting to inquire whether muscular action is the only agent concerned in effecting such extensive as well as delicate adjustment as this.

Passing now to our second series of experiments we shall attempt to point out another, and not an unimportant, factor concerned in tightening the vocal bands, which, acting independently of all muscular innervation, exerts its influence upon the cricoid cartilage, causing a movement of it identical with that produced by the action of the tensor just considered.

(*b*) THE ACTION OF THE EXPIRATORY BLAST OF AIR.

Hitherto the action of the air-blast as a tensor of the vocal bands has been recognized as producing its effect (as any current of air might stretch an elastic membrane) merely by its force in coming in contact with them. But it is the purpose of the subjoined experiments to establish the fact, that in addition to the general rise of the whole larynx, as in singing high notes, the pressure of air causes an excessive and independent upward movement of the cricoid cartilage on to the thyroid, of which no mention, to our knowledge, has heretofore been made.

The method adopted in arranging the dogs was as follows:

Having been thoroughly etherized during the early part of the operation, the animal was subsequently killed by bleeding and section of the medulla oblongata. The thyroid and cricoid cartilages were first exposed by a careful dissection in order that the normal position of the external muscles of the larynx might be disturbed as little as pos-

[1] "The Throat and the Voice," p. 105.

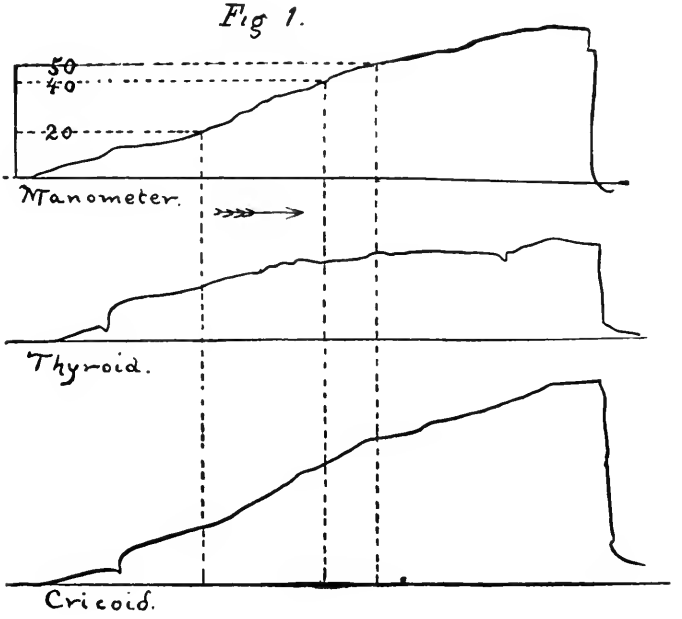
sible. The sternum being removed, a T-shaped canula was firmly tied into the trachea very near the base of the lung. One arm of the canula communicated with a Fick's manometer which registered the pressure of the air blown into the trachea through the other arm by the experimenter. The larynx being nearly closed during life by the approximation of the vocal bands in phonation or in singing it was necessary in some way to imitate, as satisfactorily as possible, the natural condition of the parts by closing up the larynx. This was effected by a pad of cotton-wool, extending down to the vocal bands, upon which a small quantity of plaster of Paris was poured, which on hardening rendered the larynx sufficiently tight for the performance of the experiments. The same levers used in the foregoing experiments were stuck into the thyroid and cricoid cartilages respectively at points represented in the drawing by black dots. Advantage was also taken of the same graphic method, the pens tracing, on a horizontal revolving cylinder bearing a smoked paper, the curves made by the moving cartilages under the pressure of the column of air coming from the trachea below. The vertical line bearing the numbers 20, 40, 50 represents the pressures in millimetres of mercury, the Fick's manometer having been experimentally graduated. The dotted lines show the positions of the ascending levers attached to the cartilages at corresponding pressures.

The arrow indicates the direction in which the curves are to be read.

The tracings in this figure (1) were obtained by inflation of the trachea when the extrinsic muscles of the larynx were intact. A glance at the diagram shows that at equal pressures the rise of the cricoid curve above its zero line exceeds that of the thyroid. By measurement we have at a pressure of 20 mm. Hg., an ascent of the cricoid lever of 8 millimetres, while that of the thyroid at the same pressure is 7. As the force of the blast of air is increased, the difference is more marked. At a pressure of 40 mm. Hg., the cricoid moves up 16 mm., the thyroid 10.5 mm. At a pressure of 50 mm. Hg., the

increase is still greater. Under this pressure the cricoid goes up 19.5 mm. to 12 mm. of the thyroid. At all pressures, therefore, in this experiment, we have an excess of movement of the cricoid cartilage over that of the thyroid.

Fig 1.

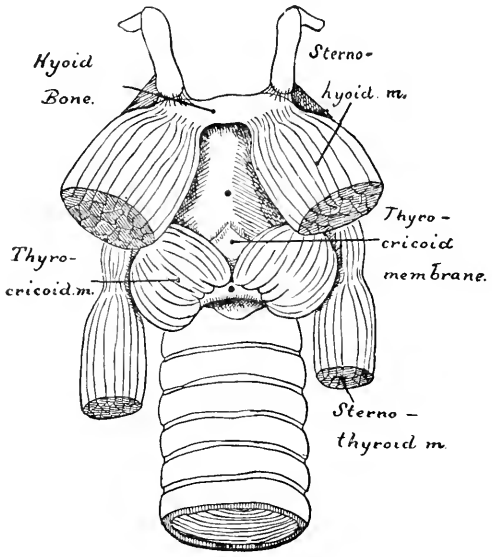


MUSCLES INTACT.

The difference in the height of the curves at the several pressures being 1, 5.5, 7.5, represents in millimetres the approximation of the cricoid pen to that of the thyroid, and a consequent stretching of the vocal bands. The amount of stretching may be computed by dividing this difference by the ratio of the length of the lever (28 cm) to the distance from the vocal process to the crico-thyroid articulation (16 mm.). This ratio being 17.5 to 1 we obtain a lengthening of the vocal bands of about .06 mm., at a pressure of 20 mm. Hg., .31 mm. at 40 mm. Hg., and .43 mm. at 50 mm. Hg.

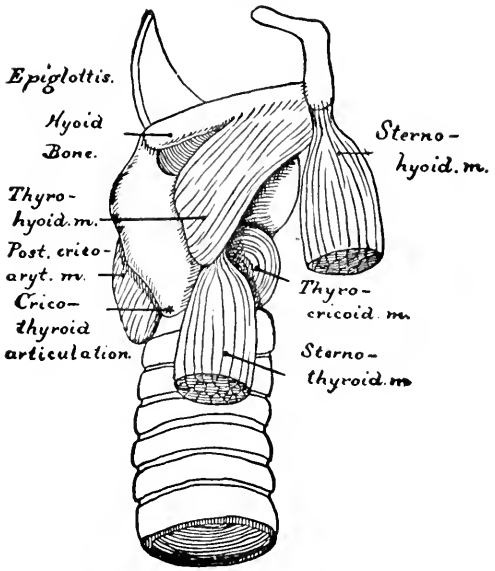
In order to determine what influence, if any, the extrinsic muscles of the larynx coming from the sternum and attached in front of the axis of rotation of these cartilages, would exert upon their movements, experiments were made of blowing up the trachea after section of the sterno-hyoid and sterno-thyroid muscles on each side. The accompanying diagrams (reduced about one third) of a dissected larynx of one of the dogs used, show the relation of the parts very clearly.

LARYNX OF DOG. FRONT VIEW.



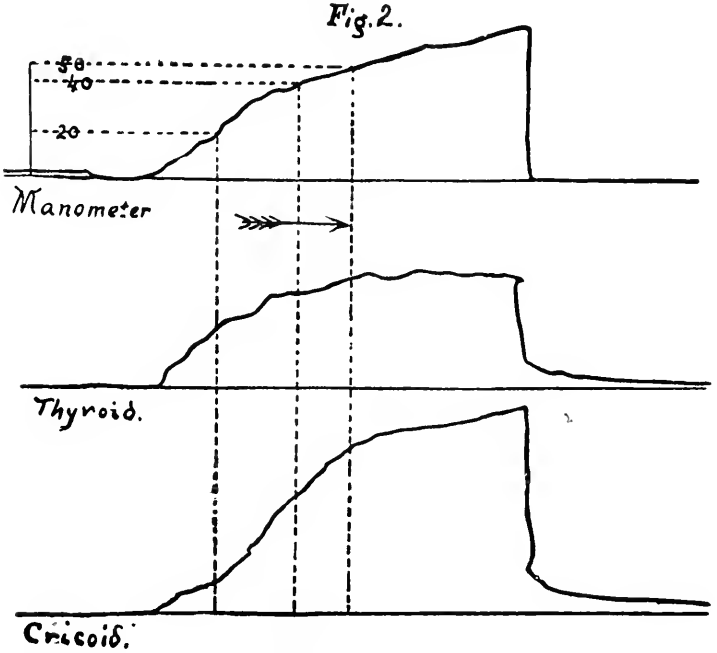
In the above dissection the sterno-hyoidei have been drawn slightly apart with the intention of exposing the anterior surface of the thyroid cartilage, in order to show the point of insertion of the lever. In the following

SIDE VIEW



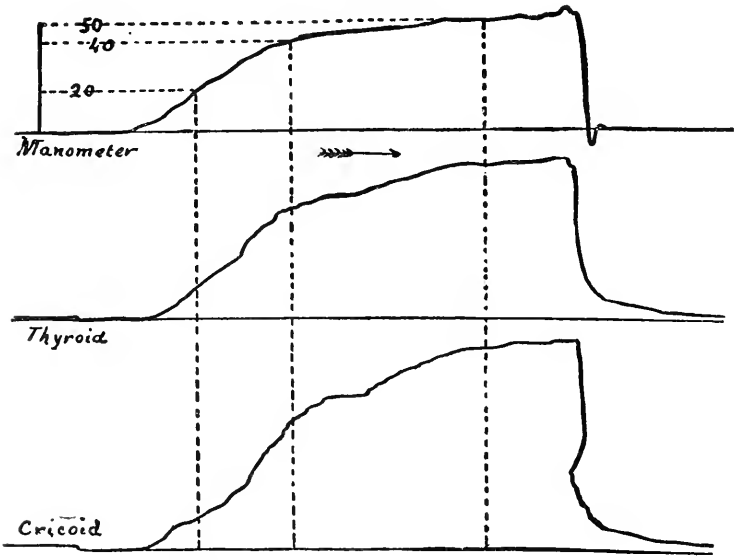
the asterisk marks the point of articulation of the two cartilages. The supposition that the powerful muscles attached anteriorly to this pivot might effect the movements of the cartilages, was sustained by the following experiments.

Fig. 2.



STERNO-HYOIDEI CUT.

Fig. 3.



STERNO-HYOIDEI AND STERNO-THYROIDEI CUT.

Inspection of these curves (figs. 2 and 3) suffices to show the increase in their height on inflation, after the depressor muscles had been divided, as compared with fig. 1 when those muscles were intact. Their relative distances in numbers at the different pressures may be best appreciated by the following table.

FIG. 1.—MUSCLES INTACT.

Am't. of pressure in mm. Hg.	Movem't of cricoid pen.	Movem't of thyroid pen.	Difference, representing approximation of the cricoid cartilage to the thyroid.	Amt. of stretching of the vocal bands in mm. (about)
20	8.	7.	1.	.06
40	16.	10.5	5.5	.31
50	19.5	12.	7.5	.43

FIG. 2.—STERNO-HYOIDEI CUT.

20	4.	7.	—3.	—.17
40	16.	12.5	3.5	.20
50	22.	15.	7.	.40

FIG. 3.—STERNO-HYOIDEI AND STERNO-THYROIDEI CUT.

20	4.5	4.	.5	.03
40	17.	15.	2.	.11
50	27.	21.	6.	.34

Ninety-two experiments of this character were recorded, which were performed on nine different dogs, and although the general results corresponded with the above figures, it must be admitted they were not invariably uniform in regard to the effect of section of the muscles. The discrepancies were, however, more probably owing to the many and obvious difficulties which beset the complicated nature of the experiments, than to any error in the principles involved. Not presenting them, therefore, as being scientifically accurate, the point we wish especially to emphasize, namely, the greater excursion of the cricoid cartilage over that of the thyroid, was evident, and we think the following facts may be said to have been established:

I. At high pressures the cricoid cartilage *invariably* moved more than the thyroid. It may safely be asserted that at *all* pressures such ought to be the result, for in only six out of the ninety-two experiments was the thyroid found to have made a larger excursion than the cricoid. This, in each instance, happened at the lowest pressure; due, perchance, to some minute obstacle on the revolving cylinder which impeded the immediate rise of the pen, or to some such accidental cause. In fig. 2, at the low pressure, it will be observed that this anomalous movement took place.

II. At high pressures, after section of the muscles, both cartilages move up more freely. But inasmuch as the thyroid rises more, in proportion to the cricoid, than when the muscles are intact, the difference between the curves, it will be noted, is less, and consequently also the stretching of the bands. That the uncut muscles, therefore, which are attached anteriorly to the axis of rotation of these cartilages should restrain their motions, to some degree, especially that of the thyroid, seems probable.

It is evident, then, from these researches, that the air escaping from the lungs produces a decided upward movement of the cricoid cartilage, in addition to the general rise of the larynx, which movement increases in proportion to the force with which the air is expelled from the chest.

This movement may be readily observed by taking an excised human larynx or that of one of the lower animals, dog or cat, and arranging it in this manner. Suspend the larynx to an ordinary iron holder by a clamp attached to the hyoid bone. Plug the glottis with cotton-wool and plaster. Inflation of the trachea causes the front part of the cricoid cartilage to rise on to the thyroid. Easy as it is to demonstrate this phenomenon, we meet with a difficult problem in proceeding to explain the cause of it. It seems fair to infer that from the anatomical construction of the larynx the ascent of the cricoid must be an active, and the descent a passive movement. For when the parts are at rest physiologically, the attachment of the cricoid to the trachea and the strength of the thyro-cricoid ligament would prevent any downward movement of the cricoid cartilage *per se*; if any such movement did take place, it would have to be shared also by the thyroid cartilage and the trachea. It was at first thought that the trachea itself, stretched and expanded by inflation, would push the cricoid upward, and thus approximate it to the thyroid. But we were compelled to abandon this view, as it was found that, after cutting the trachea off close to the cricoid, leaving only enough (two rings) to attach the canula, the phenomenon took place as before.

It was then suggested that the force arising from the communication of motion of the current of air passing from the trachea into the laryngeal cavity might communicate its onward motion to the cricoid, and thus raise it on to the thyroid. The non-resisting and elastic crico-thyroid membrane offering no obstacle to such a movement of the cricoid cartilage, while the ascent of the thyroid would be checked by the resistance arising from the approximation of the bands inside, and the influence of the extrinsic muscles outside. Not being thoroughly satisfied, however, that this explanation solved the problem, we surmised that the expansion of the larynx itself, *when inflated*, might play an important part in producing the phenomenon.

The construction of the larynx is so complicated, it is not at first sight clear why such a movement as we have

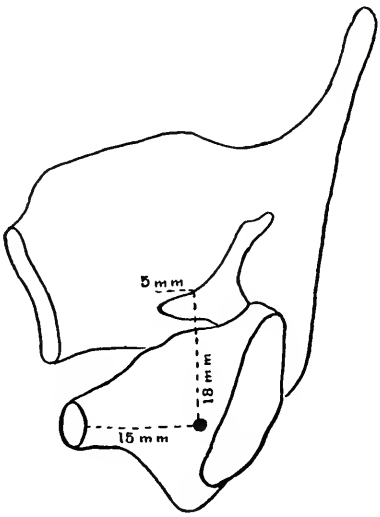
described should be caused by inflation, for when the cricoid cartilage is pulled up on to the thyroid (as by the action of the thyro-cricoid muscle) the vertical dimensions of the larynx are diminished, while the antero-posterior dimensions are increased. Whether the capacity of the larynx is increased or diminished by this movement cannot well be determined *a priori*. Therefore the following experiment was made in order to ascertain whether an upward movement of the cricoid cartilage was necessarily associated with an increased capacity of the larynx.

EXPERIMENT.

Small dog. Curarized. Artificial respiration. Pharynx plugged with cotton-wool; a cord strongly tied around the head and jaw in front of the ears, to compress the cotton and the passages leading upward. Trachea divided between second and third rings. A tubulated cork secured in the upper end, connected by a rubber tube with a delicate Marey's drum, whose lever indicates for every millimetre of excursion a certain fraction of a cubic centimetre of change of volume (1 mm. of curve = 0.01 cc. of volume). Irritation of the thyro-cricoid muscle on one side caused a descent of the lever of 10 mm., indicating an increase of the capacity of the larynx of one tenth of a cubic centimetre. When both thyro-cricoid muscles were simultaneously stimulated the lever went down 15 mm., showing, as might be expected, a still greater increase of the capacity of the larynx, as both of the muscles working together would naturally produce a more forcible rise of the cricoid than one alone.

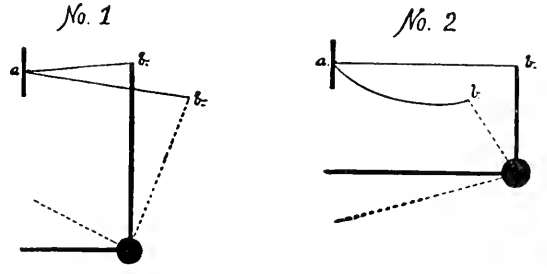
It may be questioned, certainly, how far an experiment of this nature can be applied to the living human larynx, or with what logical justice we can draw conclusions from it. We believe, nevertheless, and we shall append additional proof to sustain our opinion, that the lumen of the larynx is enlarged by an upward movement of the cricoid cartilage, and therefore in violent phonic efforts the cricoid, owing to the expansion of the larynx, must move upon the thyroid in such a way as to stretch the bands, since by so doing it increases the capacity of the larynx.

Inspection of the dissected human larynx enables us to see that the distance from the vocal process of the arytenoid cartilage to the crico-thyroid articulation is greater than the distance from this point to the anterior edge of the cricoid cartilage. The pivot then being at the articulation, the long arm of the lever is above, the short arm in front of the fulcrum. The diagram herewith presented, drawn from exact measurements, and representing the inside of the right lateral half of a human larynx from which the soft parts have been removed, shows us at a glance the relative proportions of the unequal arms of the lever. The fulcrum, denoted by the black dot, is directly opposite the crico-thyroid articulation.



Now here are two artificial larynges roughly constructed to illustrate the points of the present inquiry. The models are composed of a skeleton of wood, enclosed in a piece of thin rubber tubing, which renders them air-tight, with the exception of a small opening in the top, into which a glass tube is inserted. For convenience of description they may be designated as Nos. 1 and 2. No. 1 is articulated on the principle of the human larynx, namely, with the short arm

of the lever in front of the fulcrum. Connecting this by means of the rubber tube with the Marey's drum, and imitating the action of the thyro-cricoid muscle, by pushing the cricoid upward, we notice a fall of the lever denoting an increase in the capacity of the model. No. 2, on the other hand, is articulated in such a manner that the long arm of the lever is in front of the pivot. It will be seen in this case that, in making the same movement, the lever attached to the drum will ascend. Now, if the human larynx were constructed on this principle, it is evident that a blast of air would, by increasing the capacity of the larynx, relax the vocal bands. The relaxation being due in such a case to the fact that, as the horizontal arm of the lever is longer, and offers a larger area than the vertical arm, the pressure of the air inside the larynx would tend to force the former downward rather than the latter backward. The dotted lines in the following two cuts, indicating the manner the lever would move in the two instances, make our reasoning clear. No. 1 is according to the leverage of the human larynx; No. 2, not. The line *a b* represents the vocal band.



These researches may, perhaps, offer a suggestive clue in elucidating certain pathological conditions.[1] For instance, the fact that the singing voice can be relied upon, while, in the same individual, conversation is impossible, may, perchance, in a measure, be explained by this action of the air-blast as a tensor at high pressures. We know that the

[1] See case reported by Solis-Cohen: "Diseases of Throat," p. 642. Ed., 1880

famous singer, Malibran, was always at constant war with her rebellious voice. She would never admit that it could resist her; it was something to be conquered. And it is only necessary to refer to the interesting pages by M. Legouvé upon this remarkable woman to learn the power of a strong will and powerful lungs to overcome vocal difficulties, and how she, with her characteristic saying, "I will force it to obey me," was able, in spite of severe pharyngeal inflammation, to electrify an audience solely by the violence of her efforts. It is insufficient to ascribe such vocal feats to "inspiration" so-called. There can be no vocal effects produced without definite physical causes. There may be many which are not demonstrable, for the working of the intrinsic muscles of the larynx is so complex that it is doubtful if we can devise any means of investigation sufficiently delicate to determine accurately all the laws which regulate their marvellous adjustments. Experimentation on one's self, after the fashion of certain writers, by pushing the cartilages with the fingers this way and that, presumably imitating the action of some muscle, is too gross a method to apply to such a delicate apparatus as the larynx; and theories founded on such manipulations, however interesting, cannot be accepted as reliable. To insure accuracy, the nerve supplying the muscle, or muscular bundles, ought to be exposed and irritated, and the working of the fibres graphically registered in some such manner as we have attempted. We think the facts demonstrated by these researches justify the following conclusions:

I. The cricoid cartilage is the most movable part of the laryngo-tracheal tract.

II. The thyro-cricoid muscle, according to its physiological action, should be described as *arising* from the thyroid cartilage, and *inserted* into, and giving motion to, the cricoid.

III. The air-blast, in virtue of the mechanism herein set forth, is a direct and important longitudinal tensor of the vocal bands.

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See also the various standard text-books of anatomy and physiology; special works on diseases of the throat and physiology of the voice.

Discussion on Dr. Hooper's Paper.

The President said that he felt he must very cordially congratulate Dr. Hooper upon the important laboratory experiments he had made, and upon the great value of his paper. He thought that the Fellows of the Association would hardly feel warranted in discussing the communication without having had the opportunity of giving it the attentive reading that it deserved, and would perhaps, therefore, prefer to wait until it appeared in print.

Remarks upon the subject were now in order. Before proceeding he wished to state that, on account of the interest of the paper, he had allowed the lecturer to exceed his time without interrupting him at the expiration of the twenty-five minutes; for this violation of the by-laws, for the first time during the Congress, he requested the indulgence of the Association, and felt sure that it would be granted.

Dr. HARRISON ALLEN said that he believed that Darwin, in his great and now monumental work on the "Origin of Species," made use of the term "the imperfection of the geological record," in speaking of the great difficulty that biologists have experienced in endeavoring to make use of this record in any exact way in framing deductions which were not in themselves geological. While listening to Dr. Hooper's paper, it occurred to him that a similar phrase might be used appropriately in reference to anatomy,—we may speak of the "imperfection of the anatomical record" in considering many questions in human anatomy, as this science is conventionally taught. The speaker believed that we are only too apt to look upon anatomy as a closed subject, that all the important questions with regard to the anatomy of the human body had been studied so far that it would not be profitable to pursue the subject farther. This is the prevailing opinion of students prior to graduation, and too often is shared by teachers of anatomy. He thought that it is only necessary to listen to such papers as this of Dr. Hooper's to be convinced that little exact knowledge is in our possession on the subject of synergic muscular action. Here is a little muscle in the neck, readily exposed and easily studied, and yet it has just been shown that we have had quite inadequate conceptions of the work done by it. Too often have authorities pronounced upon the action of a muscle from its form and relations; because the thyro-cricoid has a broad base from which its fibres converge to a point, as in

the case indeed of the adductor-magnus, it had been hastily assumed that, like the deltoid muscle also, the broad portion was the origin and the narrow attachment the point of insertion. From superficial observation its action had thus been concluded to be that described in the text-book. He thought that what Donders and Helmholtz had done for the eye, and Helmholtz for the ear, researches of the character instituted by Dr. Hooper would do for the larynx.

While listening to the paper the remarks which Hilton, of London, in his book on "Rest and Pain," had made upon this subject had come into his mind. Hilton considered that the pneumogastric nerve controls the movements of the laryngeal muscles very much in the manner that a violinist plays his instrument. The motor impulse is first carried to the extrinsic thyro-cricoid muscle, as the finger of the violinist makes tense the strings of his instrument, which tightens the vocal cords; and that after this is accomplished, the motor impulse extends along the recurrent laryngeal nerve to the intrinsic laryngeal muscles.

Dr. ALLEN thought that the phenomena of the expiratory blast, as described by Dr. Hooper, were in like manner reflex in character, and were to be explained by the exciting afferent impulses along the sensory filaments of the superior laryngeal nerve, and creating efferent impulses which were sent along the motor branch to the thyro-cricoid muscle.

Dr. LANGMAID agreed with the President's remark, that intelligent criticism of such a paper as that which Dr. Hooper had just read, was impossible without further opportunity for its consideration; but he wished to say that it met with hearty approval, and that it seemed to him that for the first time there had been given an intelligent and precise explanation of some of the phenomena of tension of the vocal cords and voice-production.

While he believed that all notes of the singing voice should, theoretically, be produced without any increase in the force of the wind blast, it is easy to see from Dr. Hooper's exposition of the action of the expiratory breath upon the movement of the cricoid, and the consequent increase of tension, exactly how the blast of air is called in as an assisting, supplementary factor in the production of intense high notes. Secondly, the explanation of how the concentration of the expiratory blast in the larynx, the chink of the glottis being closed, causes a certain amount of tension of the cords, reveals the reason of its frequent use by vocalists, as it

does also the frequently observed fact that a singer, whose conversational tone is hoarse, may still have a clear singing voice, because, as indeed was already well known, this concentration of air in the larynx constantly takes place in the production of the singing voice on account of the continuous production of vowel sound.

Dr. HOOPER, in closing the discussion, said that he was sure that Prof. Bowditch would be as much gratified by the interest which the Fellows of the Association had taken in the experiments as he was himself. It would be impossible to perform such experiments single-handed. It was his more than pleasant duty to say, that had it not been for the fact that the distinguished Professor of Physiology at Harvard took especial interest in the larynx, and was willing to devote his thought and ingenuity to the details of the experiments, it would have been impossible for him to have presented the paper which he had had the honor of reading before the Association.

Paper.

AURAL COMPLICATIONS OF INFLAMMATORY CONDITIONS OF THE NOSE AND THROAT.

BY BEVERLEY ROBINSON, M.D.

FOR several years past, it has seemed to me at once a singular and regrettable circumstance, that professed throat specialists should be, apparently, either ignorant or neglectful of the aural complications of ordinary nasal and throat affections. Very infrequently, if ever, in the meetings of the New York Laryngological Society, have these diseases been alluded to, much less exhaustively considered. The same is true in regard to the annual gatherings of our Association. Now this should not be, for several good reasons:

1. Aural complications, particularly in inflammatory conditions of the nose and throat, are relatively quite frequent.

2. When they do occur, they are always important.

3. It behooves the laryngologist, more than any other specialist except the aurist, to be familiar with their symptoms, course, and treatment.

If these propositions be granted, it is not out of place at the present to study with you, in a certain measure, the outcome of personal observations. This study must needs be very imperfect, for two reasons: first, because I cannot, unfortunately, lay claim to more than a somewhat imperfect knowledge of aural diseases; secondly, because time and the occasion do not permit more than a limited attention to be assigned to the consideration of any special subject, no matter how important it really is.

In regard to my subject, I would divide it into: 1st, aural complications occurring in acute nasal and throat diseases inflammatory in character; 2d, aural complications of chronic inflammatory conditions of the nose and throat.

I.

1.—*Aural complications of acute inflammatory conditions of the nose and throat.*

It is a somewhat frequent occurrence to hear patients affected with acute rhinitis complain of more or less uneasy sensations in the ears. Sometimes it is a full, obstructed feeling, as if their ears were stuffed with a foreign material. Again, there is a sensation which renders it almost imperative for the patient to rub or dilate the external auditory canals with the fingers. At times the patient will expand forcibly the membranæ tympani with each effort at blowing the nose; again, the nose will remain obstructed on either side for a time, and then in a sudden manner it will become pervious, and the ears from being completely clogged, as it were, will seem much lighter or freer.

Evidently, in these cases, while for a time there was no air-renewal in the middle ear through the Eustachian tubes, finally this communicating channel to the interchange of air was opened, and immediately the intra- and extra-tympanic atmospheric pressure were equalized, and sound-waves could be felt and disseminated in a more normal manner.

In rare instances, accompanying or following an attack of acute rhinitis, I have remarked an evident inflammatory

condition of some intensity propagating itself to the middle ear and membrana tympani. This inflammation is marked by real pain in the ear itself, by a red and injected appearance of the drum-heads, and of the inner ends of the external auditory canals.

Sometimes the complication is much more marked on one side than the other; sometimes both membranæ are about equally affected. In no instance that has come under my observation has an *acute coryza* limited to this membrane itself been the direct occasion of suppuration in the middle ear and perforation of the drum-head. Such an unfortunate sequel may and does occasionally occur, but not often, happily, and we should, as a rule, only dread its advent when the rhinitis is merely one localization of an acute attack of influenza, in which the entire mucous tract of the nose, throat, eyes, ears, larynx and bronchi, are all more or less implicated at nearly the same time. Under these latter circumstances it is indeed not very rare to encounter, here and there, a child or adult who has had a perforation of the drum-head with long-continued purulent discharge from one or both ears. Unless the patient have a constitutional defect, be poorly nourished, or neglected by nurses or parents, such instances can but detract from the renown of the attendant physician.

2.—*Aural complications of diphtheria, typhoid, and the eruptive fevers.*

Those amongst you who practice an exclusive specialty as laryngologists will not, of course, encounter these complications frequently—or at least this is strictly true of these affections during the first weeks of their duration. For, although such a one may be called to treat an occasional case of diphtheria, particularly if the operation of tracheotomy be entertained, he will not probably be the attendant in the course of typhoid or the exanthemata. Now, while this statement is undoubtedly correct, it behooves even those who have entirely discarded general practice to be familiar with diseases which affect the organ of audition during their acute course, so that when called upon to counsel in a given case, though an exceptional one,

they may be thoroughly fitted to make a correct diagnosis and mark out the most judicious treatment. Again, many of you take care of patients whose throats and nasal passages have remained inflamed and thickened as a result of the affections alluded to. In these instances there is often present an actual impairment of audition quite equal, in its importance to the individual, with the morbid nasal or throat condition for which treatment was at first solicited. Still another reason why this knowledge is of importance to the pure larnygologist, lies in the fact that the *general practitioner* is oftentimes, I regret to add, ignorant or careless with respect to these aural complications of serious acute febrile disorders. This is an admitted fact. The *aurists* have done their part already to remedy, as far as they could, a great existing evil in general practice; surely, then, the laryngologists have, likewise, a duty to perform in this regard, by warning their professional brethren, when opportunity serves, of the consequences of their lack of knowledge or forethought—or indeed of something which can even less easily be condoned. Now, then, what does actually occur in the febrile affections to which I have made reference? Take first of all scarlet fever, for the reason that in this affection particularly, aural complications are of relatively great frequency. A child is attacked with a scarlatinous rash, the fever is moderate, the tonsils red and swollen, covered or not with patches of soft, pultaceous deposit; and thus whilst the disease is distinctly marked, no grave phenomena are present. During ten days or more the disease marches with its usual strides and nothing abnormal occurs. Toward the end of the second week, however, the child, without very obvious cause at first, is less quiet; it is more restless, feverish, and disposed to fret. Within twenty-four or forty-eight hours it is remarked that the little patient carries his hand to the head, says it hurts him, or is unwilling to lie on one or other side. Perhaps there is no great pain, only a sensation of uneasiness. At times the fever is not increased, the pulse scarcely accelerated, and the little one is willing to take such food or drink as is permitted. With even the preceding symptoms the watchful

and informed medical attendant will insist upon the importance of an aural examination by means of the speculum and short-focussed hand- or head-mirror. Such vigilance will have its reward, for most probably the drum-head is seen to be slightly bulged, opaque, and with a decided pinkish coloration in certain well-defined areas. Here, then, we find the evidences of a beginning acute catarrhal inflammation of the middle ear, and the indications for treatment are plain and simple.

Take another case, that, for example, where the preceding symptoms have been remarked but not attended to, because their significance was misunderstood or belittled. Now what will occur—frequently, according to some, almost inevitably, according to others? In a very few hours, in the course of a single night, the pillow of the little sufferer will be stained by an aqueous, muco-purulent, or purulent discharge from the external auditory canal, and on inspection of the drum-head, after cleansing the meatus, it will be found to be perforated with a large opening. During several weeks afterward the otorrhœa will continue in spite of assiduous care, and happy is the child who has not acquired a defect in its hearing power which will be permanent.

What has been related of scarlatina is true, less frequently however, of measles and variola.

Similar phenomena, also, occur in both diphtheria and typhoid fever. They are not confined to children; they may also take place in adults similarly affected with these diseases. How should such cases be regarded? Are they only the evidence of an extension of a special inflammatory process from the throat or nasal passages through the Eustachian orifice and tube to the tympanic cavity by reason of a continuity of tissue, or does the disease itself, viz., scarlatina, measles, variola, typhoid fever, diphtheria, fix itself at the same time on the mucous membrane lining this cavity, just as it does upon that of the throat, nasal passages, or respiratory tract generally? The latter appears to me to be the more likely opinion in a majority of instances, still, in view of the precise time at which these aural complications occasionally declare them-

selves, and also of the fact that at times the nasal or throat affection may have been of more than usual severity, I incline to the belief that sometimes there is indeed a direct extension by way of continuity of the inflammatory disease from the nose and throat directly to the ear itself through the Eustachian tube.

II.

Having brought before you this first part of my subject, I would now direct your attention to the second, viz.: the *aural complications of conditions of the throat and nose which are both chronic and inflammatory in their nature.*

1.—It was for quite a long time a somewhat general impression amongst laryngologists, and, I may add, I shared this belief, that chronic inflammatory affections of the throat and nose in which there was a considerable degree of thickening involved, were more likely to be accompanied, or followed by inflammatory diseases of the middle ear, than those nasal and throat diseases where no evident thickening of tissue was present. This was specially true of all obstructive forms of nasal catarrh, in which one or both nasal passages were almost completely occluded. In a somewhat similar manner it was generally believed that a chronic pharyngitis, when at the same time notable enlargement of the tonsils existed, was a condition which rendered aural complications probable. In fact, it was assumed,—incorrectly I now believe,—that the deviation of the nasal septum toward the left, and the consequent obstruction of the left nasal passage, was the determining cause of left-ear deafness; the explanation of this effect being the fact that a proper inflation of the middle ear was thus prevented, and in consequence that the external atmospheric pressure of the membrana tympani was not equally balanced by the tension on the drum membrane from the air contained within the tympanic cavity. Unfortunately for the truth of this explanation, it has been observed that even when impairment of hearing existed in conjunction with deviation of the nasal septum, the defective ear was not always situated on the same side with the obstructed nasal passage. Be-

sides, it has been remarked that notable diminution of auditory power is *not* an essential and invariable consequence of an obstructed nasal passage. Sufficient air can be inspired through the non-occluded nasal passage to supply the middle ear with its share of this fluid. As to the belief that obstructive forms of nasal catarrh—whether they be of simple or specific nature—are more frequently followed by aural disease than those forms which are atrophic in character, this statement is certainly open to question. That they are frequently accompanied by acute, subacute, or chronic inflammatory disease of the middle ear is only what we have all more or less become familiar with. Sometimes the aural inflammation is unquestionably but an extension of the inflammatory process from the nasal or naso-pharyngeal mucous membrane directly to the Eustachian orifice or tube. Sometimes, however, both in children and adults, the same causes which give rise to the morbid process in the nasal passages and upper portion of the pharynx occasion, at the same time, an inflammatory condition of the Eustachian orifice and tube. In no other way can we account satisfactorily for those very sudden attacks of acute median otitis, so painful in character, and which, in children particularly, are the obvious direct result of a cold contracted and grafted on, as it were, an old inflammatory condition. In adults it is more usual to notice that an acute exacerbation of a chronic coryza has persisted for several days before the ears are sensibly and painfully affected. While this statement is correct, it still remains true, that by close questioning and by careful examination we can sometimes find sufficient proofs already of a commencing aural inflammation when the patient himself is undoubtedly unconscious of the fact. If an aural inflammation accompanies an inflamed condition of the nose which is obstructive in character, the occluded nasal passages, so long as this condition persists, are an efficient factor of its aggravation. It behooves us, therefore, to free the nasal passages as speedily as we can do so, with a due regard for our patient's present and future welfare, and thus we help to lessen or abort the aural inflammation. Rarely do we see in

our throat clinics, or in our private offices, patients in whom obstructive nasal catarrh has been followed by perforation of the drum membrane. Fortunately, the median otitis usually falls short, or does not reach this culminating point. A similar statement can be made with strict correctness in regard to cases of pharyngitis in which there is considerable hyperplasia of tissue, and where the pillars of the fauces and uvula are equally affected. Enlarged tonsils, when they are the seat of a chronic inflammatory process, predispose to inflammatory disease of the Eustachian tube and through it of aural catarrh of the middle ear. They are thus influential in the causation of an aural complication by reason of the altered secretions which they are continually pouring out upon the surrounding mucous membrane. In my experience it is not true to affirm that they cause this aural complication by pressure upon the Eustachian tube. Such instances may be possible, but must be extremely infrequent. In fact, I do not now remember a single case in which a large tonsil produced closure of this tube, or where excision of it restored hearing previously much impaired or lost.

All that can be properly expected in this direction from ablation of the diseased organ will be to put the throat in better shape for successful treatment by future applications of different mineral or vegetable astringents, and hence lead indirectly to an improvement of the aural affection. When one or both ears become affected in this form of nasal or throat disease, it is incumbent not merely to inspect the external auditory canal and drum-head by means of the aural speculum, but also to make a careful rhinoscopic examination of the condition of the naso-pharynx and the Eustachian orifice. Usually the naso-pharyngeal space will be found to contain more or less white or yellowish viscid mucus, or indeed a certain amount of muco-pus. The lips of the Eustachian orifice are generally swollen, red, and œdematous. Sometimes they, too, are coated with some of the same kind of secretion which we have remarked in the naso-pharynx. More frequently a slight grayish coating is alone remarked upon the inner aspect of the lips

of the Eustachian orifice. The opening itself seems more than normally large; at times it is apparently somewhat contracted. If we attempt to inflate it according to Politzer's method, we frequently are obliged to make more than one attempt before we can blow a sufficient quantity of air into the middle ear. After several vain attempts I have often been obliged to recur to the vapor of a few drops of chloroform which had been poured on the sponge in the receptacle attached to the rubber tubing connected with the air-bag. In these cases it is rarely necessary to use the Eustachian catheter in order to inflate the middle ear properly. The Eustachian orifice is never ulcerated unless it be in advanced syphilitic or strumous disease. Enlarged follicles may occasionally be seen in its vicinity, just as we find them often developed upon the posterior wall of the middle pharynx. If the external meatus and drum-head be inspected under a good light we often find the auditory canal blocked by impacted cerumen, and until this be removed we cannot make a careful examination. When the ear-wax has been got rid of by means of the syringe, or probe, or other suitable instrument, we are able to examine the organ to better advantage. Then it is that we remark a thick, somewhat opaque, drum-head. Around its outer margin and extending for a line or two in the external auditory canal, there is plainly an inflammatory rim, and when this is the case the patient shows signs of slight pain when the speculum is introduced even with great care. Often, also, the drum membrane itself is of pinkish coloration, and abnormal vascularity is seen on either side of the arm of the malleus. The external auditory canal, in nearly its whole extent, may be covered with a furfuraceous deposit which is nothing more than a large number of epithelial cells which have become detached from the cutaneous lining and form so much débris. This epithelial débris is accompanied by annoying itching, and, at times, is evidently due to an eczematous condition of the canal, or indeed allied with diffuse thickening of the skin of the canal which is inflammatory in nature. When the inflammation of the throat was of rheumatic nature, I have also

noticed considerable thickening of the drum-head and certain concomitant symptoms which caused annoyance to the patient. These symptoms, in the rheumatic cases as well as in the others, are pain, vertigo, and noises in the ears. The pain is usually slight; sometimes it is a mere sensation of fulness. Occasionally slight pressure in front of the external auditory canal increases it. There is often a tendency to introduce the finger into the auditory canal and work it about so as to relieve the itching, fulness, or other uneasy sensations of which the patient is conscious. The noises in the head or affected ear are not often very intense or painful. They are more annoying in the night and when the patient is lying down than during the day. They resemble many different sounds (ringing bells, roaring, etc.). The vertigo is often a symptom which causes considerable uneasiness. It may come upon the patient under all circumstances, when walking, standing, sitting, or lying down; at home, in church, in the theatre, in the street. They feel suddenly as if they were going to faint away, or fall, if they are standing when it attacks them, and are compelled to take hold of the nearest object for support. Frequently they consult their physician in regard to the vertigo, because they believe it depends upon the condition of their stomach, or because they are run down in health, and do not think of it being connected with any aural difficulty until informed of it by their medical attendant.

The hearing power in these cases is more or less defective, according to the advance the affection has made in time, or in relation with the intensity of the attack. Usually a watch cannot be heard at more than eight to ten inches, and sometimes much less. Even at contact, I have known it to be barely audible. In the same way for the ordinary spoken voice. Sometimes, at a distance of twelve feet, the voice is heard with some difficulty, and again, the voice is heard when one is quite far removed, whilst the watch is only heard when brought within a few inches of the affected ear. I have known these patients to vary considerably in their hearing power during the course of the day. In the morn-

ing, when they first wake, and sometimes for two or three hours afterward, they are much stopped up and can hear very imperfectly. Later on in the day, and when they have expectorated or blown from the nasal or throat passages a considerable amount of thick mucus of different color, they are relieved and can hear much better. Instead of having their ears completely blocked up they seem to open, or become permeable. Under these circumstances, with each effort of blowing the nose the air is sent forcibly into the affected middle ear and occasions very unpleasant crackling sensations, no doubt due to the contained mucus in its cavity. The crackling in their ears is also very disagreeable, at times, as a subjective sensation, when they are at meals and make efforts of deglutition. Both the full and crackling sensations are often greatly relieved, at least for a while, by the use, several times repeated, of Politzer's method of inflation.

2.—*Aural complications of the atrophic forms of chronic inflammatory conditions of the nose and throat.*

In my experience, these forms of nasal and throat affections are particularly prone, sooner or later, to be complicated with aural disease. The aural affection is ordinarily of chronic nature, rarely suppurative, and belongs to the class described by aurists as chronic non-suppurative inflammation of the middle ear. The nasal and pharyngeal inflammation may have existed during several years before the patient appreciates that his ears have become damaged. Indeed, many of these patients are already very deaf in one ear at least, when they come under the care of the specialist in laryngology, and it is only after a careful examination of, and the use of tests in regard to, the condition of their power of audition, that they are willing to recognize how imperfect their hearing really is. They have never, or rarely, any notable degree of pain in their ears; the tinnitus aurium has also been moderate in amount and not sufficient to incommode them much; and as to their feelings of vertigo, these they have attributed to a disordered stomach, or liver, or indeed to the fact of being below par in general strength and health. It is only by question-

ing such patients closely at times, and even by insisting upon the nature and importance of the aural disorder, that we can make them appreciate its real gravity. Of course these are not the only cases, since we meet with a certain proportion of instances in which the patient is fully conscious of his loss of hearing and of the noises in the head, or vertiginous tendencies, which give him such legitimate anxiety. In these examples, however, it is believed that the sequelæ are the ordinary, natural results of catarrh, and having tried many prescriptions already of regular and irregular practitioners, without benefit, the sufferers themselves have naturally become suspicious and doubting in regard to almost every plan of treatment. Accompanying the chronic non-suppurative inflammation of the ear, we shall find an atrophied and dry aspect of the pituitary membrane. The secretions therefrom are relatively small in amount. Dry, thin, and quite fetid crusts, dark in color, are found adherent upon the septum and turbinated bones. Under these crusts, when detached by irrigation and forcibly blowing the nose, the mucous membrane is at times superficially ulcerated, bleeds readily, and has the aspect of a chagrined surface. In the naso-pharyngeal space larger masses of inspissated mucus, or muco-pus, form and are expelled by distressing efforts of scraping and hawking after more or less prolonged intervals. The space itself is of larger dimensions than normal, owing to atrophy of the soft tissues, so that posterior rhinoscopy is usually made with great facility by an expert examiner. Oftentimes there is marked development of the adenoid tissue of the vault of the pharynx. The Eustachian orifices are wider than normal, and may or may not be plugged by a certain amount of dry mucus. If they are so obstructed, inflation by means of the Politzer bag is often difficult, sometimes almost impossible after several successive attempts. The posterior extremities of the turbinated bones are ordinarily of a grayish aspect, smaller than normal, and permit of satisfactory inspection of the choanæ. The median post-pharyngeal wall has a dry, glazed aspect, which almost always betokens the condition of the portion of the pharynx described above,

and at the same time is accompanied by very considerable fetidity of the expired breath. The tonsils are small in size; the soft palate pale or red, and injected with numerous small vascular twigs, but never thickened or œdematous. If we inspect the drum-heads on either side, we find them dull, opaque, thickened, and very markedly depressed. The ossicula beneath are often ankylosed, and do not transmit the sound-waves as they should, owing to surrounding plastic exudation. Further, the membranæ tympani have lost their elasticity, and are not as impressionable or easily moved by a strong current of inflated air as they are when in a normal condition. Naturally, under these circumstances, the patient's hearing power is much diminished, and all the rational troubles of aural impairment are very pronounced. These are tinnitus of different kinds, vertigo, and more or less uneasy or even painful sensations in the middle ear itself.

Now that I have endeavored to give an account, although of necessity a brief and somewhat imperfect one, of the most prominent physical conditions present in the preceding cases, I shall say a few words in regard to rational treatment in children and adults.

1.—Let me consider the *acute cases*, those in which the aural affection follows closely upon an acute, more or less general, inflammation of the mucous membrane lining the air-passages. In this condition of the ears, which is that of acute or subacute catarrh, no measure is of more decided value both in relieving pain as well as ultimately diminishing the inflammatory process in the ears, than douching the ears repeatedly with warm water by means of the fountain syringe. This form of douche may be employed every hour or two, for the space of five or ten minutes, if required, or until pain has greatly abated. Oftentimes before the bag of the fountain syringe has been entirely emptied once, the patient will express a sense of great comfort. The well-being, indeed, established in this manner, is sometimes quite astonishing, and this is true frequently, when previous to its application many household panaceas had been resorted to with little or no benefit. If the douche

fails, as it occasionally will do, and no lasting result is obtained, either in the diminution of pain, or in lessening the inflamed condition of the ear, it is essential to apply one or two leeches in front of the tragus and draw blood from the congested vessels of the ears. Ferrier's snuff may be blown freely into the nasal passages on either side, and a solution of chlorate of potash with a small proportion of tannin and glycerine in water may be used as a gargle,[1] or direct throat-application. The bowels should be moved by a moderate dose of mass. hydrarg., followed by rochelle salts, and an anodyne of paregoric or morphine given at night to promote quiet sleep. With this plan duly carried out we shall rarely see such cases last in their acute form beyond twenty-four or forty-eight hours. In children who are restive, or somewhat difficult to manage, small but repeated doses of aconite may, at times, be employed with excellent results, as regards the diminution of the generalized congestion of the affected parts, and may in a certain measure take the place of the other medicinal agents first recommended, with the exception of the continuous douche, which should be invariably brought into use if possible. A few children are frightened very much at first by its application, but soon lose their dread of it when they have experienced the great relief from pain afforded by its employment. After the use of the douche the external auditory canal should be dried with absorbent cotton wrapped on a holder, and the ears kept moderately warm by a piece of cotton-batting laid over the auricle and the auditory canal itself.

2.—*As regards the treatment of aural inflammations complicating the acute febrile affections* (*diphtheria, typhoid fever, the exanthemata*).

Not infrequently, as I have already stated, the inflammation of the ear developes during the course of these diseases in a somewhat insidious manner. It may be that the patient complains but little of the ear; the pain, in fact,

[1] The *method* of gargling is not unimportant. The one first recommended by Von Tröltsch, and afterward described by Roosa (*v.* "Treatise on the Diseases of the Ear," 4th ed., New York, 1880, p. 299), is without doubt the best.

in this organ is but slight, and unless the practitioner be fully alive to the consequences of even a relatively latent inflammation in the ear, under the circumstances considered, he may perhaps pass it by with insufficient or indeed no attention whatever. The first intimation of aural inflammation in this case, therefore, is perhaps a muco-purulent discharge from the external auditory canal, which means perforation of the drum-head and that the case must be treated as one of purulent median otitis. To do this *properly*, implies, first of all, to keep the ear as clean as possible by means of frequent irrigation with warm water, and by the aid also of a holder wrapped with cotton-wool. The washing of the cavity of the tympanum may be advantageously repeated three or four times in the twenty-four hours, and sometimes more frequently still is desirable. After one of these cleansings, morning or evening, a few drops of a mild solution of some one of the common mineral astringents, such as sulphate of zinc, or alum, should be dropped into the ear, and will help very much by degrees to diminish the amount of fluid secretion coming from the ear. The addition of this astringent should not be made during the first few days after the perforation of the drum-head has taken place, but should be reserved for a later period. The proportion should be from one to five grains of the solid substance to an ounce of water. In the event of the discharge from the ear taking on a fetid character, an injection, occasionally, into the auditory canal with an ordinary hand-syringe in brass or rubber, of a solution containing liq. sodii chlorinatæ—about in the proportion of one part to eight parts—is very desirable, and will usually rid the patient after a few days of this disagreeable symptom. On the other hand, let us take an example where, by reason of considerable local pain and discomfort, attention has been directed to the condition of the ear before a perforation has actually occurred. In this instance the aural douche is still very useful, but rather to quiet an inflammation already quite far advanced, than to keep an open cavity clean of secretion. I have seen certain cases in which the propriety of

leeches, or indeed of myringotomy, had to be thought of, but where happily neither were considered essential after giving the aural douche a fair trial. The application of leeches in depressing febrile disorders is always to be regretted, as they help to exhaust the patient still further; and myringotomy, to be properly performed, requires a steady and an informed hand, which cannot always be procured. Even if an aurist see the patient at the precise juncture when his special services are most required, he will decide against a surgical operation, very possibly, in view of the many chances of the patient doing well without it. At a later period, when the inflammation of the ear has in part subsided and only a moderate defect of hearing remains, with perhaps a slight effusion of mucus or plastic material into the middle ear and Eustachian tube, it is usually advisable to inflate the ears a few times, at intervals of several days, by means of the Politzer bag, so that complete hearing power may be restored.

3.—*Treatment of aural complications of hypertrophy of mucous membrane lining the nose and throat.*

The first thing to be attended to is to make the passage-way through the nose free, so that the patient may have an easy and satisfactory nasal respiration. This may be done to-day quite readily in one of three ways :—

1st.—By application of acids, of which nitric acid, monohydrated, is, in my experience, the most reliable.

2d.—By the galvano-cautery.

3d.—By Jarvis' wire snare.

To the first I give preference in cases not far advanced ; to the second, in instances in which occlusion is more considerable ; and to the third, in examples where the posterior extremities of the turbinated bones are particularly the cause of obstruction and the other two methods lead to only partial good results.

In view of one demonstration by Dr. Clinton Wagner of our city, where I was fortunate to be present, I feel called upon to add that I believe the use of the dentists' treadle and burrs of different shapes may, when skilfully manipulated, be decidedly useful, or indeed radical, in overcoming

nasal obstruction. After the obstruction is overcome through the nasal passages, we should immediately set about making proper alterative applications to the naso-pharynx, so as to reduce the thickened condition of the mucous membrane lining this cavity and the neighboring parts, and to place the throat ultimately in a much better general condition, and, in a measure, to indirectly help the aural complication. In this manner, the duration of the disease may be shortened and its gravity as regards sequelæ considerably lessened.

Here, again, it is also desirable, if there be some pain and stuffiness present, to inflate the ears twice a day for a week or so, and if the pain become, in spite of the use of Politzer's method, more severe and harassing, to recur to the use of the aural douche in the external auditory canal several times a day, and perhaps to apply two leeches on one or two occasions in front of the tragus of the affected ear.

Noises in the head, in these instances, have more than once been greatly benefited by my using hydrobromic acid in quite large doses, as advised by Woakes; and pain in the ears by salicylate of soda in mixture, according to my own initiative.

Sleep is usually not interfered with, nor is an anodyne required. Of course, in every case where adenoid vegetations of any size are present in the naso-pharyngeal space, they should be removed by an appropriate operation.

4.—*Treatment of aural complications of atrophic inflammatory conditions of the nose and throat.*

In these instances careful continuous treatment is particularly necessary,—not so much, frequently, to restore the hearing completely, nor indeed to improve it always in a great degree. It is rather to be considered essential, because, unless attended to, the patient may become so deaf as to be debarred from all social enjoyments, or have a professional career altogether arrested. In these cases the naso-pharyngeal condition must be treated with suitable applications every day or every other day. Among these I know of none so grateful to the patient and so useful in the disease as that of carbolic acid, borax, glycerine, and

water, in more or less large proportions, and employed either by direct topical use with the brush, or else by means of Sass' spray-producer. These applications remove the sensations of dryness and irritation from the pharynx, and soften and otherwise change advantageously the character of the throat-secretions. Preceding the use of the spray, I consider it very important to inflate both ears by Politzer's method, or by introduction of the Eustachian catheter. Twice or three times a week is usually, after the first week or two of treatment, often enough to inflate the ears. Sometimes the introduction of the Eustachian catheter is absolutely required in order to render this inflation at all thorough and effectual. In these cases I am of opinion that the use of the douche or posterior nasal syringe is usually hurtful; for while I do not believe they are so apt to aggravate directly the already existing morbid affection of the ears as when the nasal passages are obstructed, still I am confident they increase very considerably the *quantity* of secretion in the post-nasal space by occasioning a considerable degree of artificial irritation, and hence their use is not considered advisable by me.

Sometimes in these cases, especially where there is an evident rheumatic dyscrasia, I have known moderate doses of salicylate of soda taken internally to be of great benefit. Further, I am satisfied, by several examples already observed very closely among my private patients, that a season at some one of the sulphur springs of France or this country is of very great utility in benefiting the aural condition and hearing power of these patients. From my own experience, I am inclined to recommend Aix-les-Bains, in Savoy, as a charming and especially recommendable resort for those persons who are thus affected. I believe the efficacy of these waters is due to two causes: first, that all the arrangements for bathing, massage, atomization, douches, and general hygiene, are excellent; second, that the water itself may be drunk in fairly large quantities, and thus be rendered useful through the different natural emunctories of the economy, without affecting injuriously the digestive organs, the reason being that these waters contain a far less

proportion of insoluble sulphate of lime than do our own sulphur waters of Richfield and Sharon.

These statements are not empty theories, but such as several important facts have strongly corroborated.

In concluding this paper I would urge in very strong terms the necessity of laryngologists guiding and directing their patients more than they usually have done, and continue to do, in regard to the hygiene of their ears. A case of moderate nasal catarrh of the hypertrophic or atrophic sort, is not of itself such an important disease, particularly if we merely view it as regards the amount or character of the sputa that a patient expectorates daily. The same is true of the sensations of dryness or stuffiness of which many catarrhal patients complain, and indeed come to the throat specialist to be relieved of. But when we reflect upon the risk to the ears, eyes, and olfactory sense which is frequently incurred; when we discover that the hearing, sight, or smell is already more or less defective and weakened, it behooves us, one and all, to impress these facts forcibly on the minds of our patients, and either to give them the careful, judicious, and learned attention their cases imperatively require, or else to direct them to some prominent aurist or oculist, who, wiser than we, shall do for them what, after all, is *most* important for their welfare.

Now, then, in my quality of laryngologist, I can but earnestly wish that *all* laryngologists may be hereafter qualified to attend to what is as surely in their particular line of work as in that of any other specialty.

Discussion on Dr. Beverley Robinson's Paper.

Dr. MACKENZIE called attention to the influence of reflected irritation from the turbinated tissues of the nose as a factor in the production of middle-ear congestion and catarrh. In a certain proportion of cases occurring in his clinical experience, he had noticed congestion of the drum-head and other symptoms referable to middle-ear disease which could not be explained on any other hypothesis, and which were dissipated by topical treatment of the local nasal disease. He had, furthermore, succeeded in producing congestion of the membrane of the tympanum,

pain, etc., by artificial irritation of the nasal mucous membrane. Cases now and then present themselves, who, from failure on the part of the physician to recognize this relationship, and in the absence of well-marked nasal disease, are treated as hysterical, and their ailments believed to be imaginary. He thought that the recognition of these facts, and the proper appreciation of their importance, would materially aid in the diagnosis and treatment of this heretofore obscure class of affections.

Dr. JARVIS said that especial attention should be given to the part played by turbinated hypertrophies, gelatinoid polypi, and to the deviated septum, in the production of aural difficulties. It is not necessary that the orifice of the Eustachian tube should be occupied by the growth. Pressure upon the edge of the tube may mechanically interfere with audition by disturbing the pneumatic equilibrium of the middle ear. Deviation of the septum may thus occasion deafness by a coexisting distortion of the nose preventing the efflux of secretion, and favoring the extension of inflammation into the middle ear. The ease with which these deviations can be removed would warrant their immediate excision.

Dr. ROBINSON said, in closing, that he agreed entirely with Dr. Mackenzie, and believed that his remarks were correct. He had some weeks ago been made aware of the importance of this reflex nervous influence upon the ear from nasal disease, but not in sufficient time to incorporate it in his paper. He thought, however, that a certain number of cases would find their true explanation in this way.

Referring to Dr. Jarvis' remarks he stated that he formerly had shared his opinion as to the effects of mechanical obstruction of the upper air-passages upon the hearing of the patient, but had recently seen some cases which had led him to doubt its applicability. In a woman under his care at the New York Hospital, although the nose and pharynx were almost completely obstructed by polypoid growths, still her hearing was good. Perhaps in view of cases like these he might conclude that Dr. Jarvis was attributing more importance to such deviations as a cause of inflammation to the middle ear and disorders of hearing than experience justified.

Paper.

THE "LACUNÆ TONSILLARUM."

By D. BRYSON DELAVAN, M.D.

TO the casual observer the surface of the normal tonsil presents a number of depressions, so slight in extent and so unobtrusive in appearance that they hardly seem to call for more than a passing glance. That most writers consider them as unimportant is evident from the hasty manner in which, in articles upon the subject, they are generally dismissed. Believing, as we all doubtless do, that the cavities of which these indentations are the orifices, constitute a prominent element in the anatomical structure of the tonsil, and play an important rôle in its general economy, it has seemed desirable to call especial attention to them, to the end that certain points in their gross and minute anatomy might be prominently brought forward, and that the facts thus suggested might be utilized in the practical treatment of diseased conditions of the part.

These depressions, the lacunæ tonsillarum, as is well known, are a series of follices formed by the reduplications of the oral mucous membrane and their contained adenoid tissue, which constitute the organ known as the tonsil. Their number is variously estimated at from eight to eighteen. Many of them are spacious in extent, and they commonly penetrate deeply into the substance of the gland, sometimes almost reaching to its hilum. There are, also, in the interior of the tonsil, single larger cavities, each one of which includes several follicular folds, and procures their common discharge at the periphery. By this ingenious arrangement the actual superficial extent of the tonsil is greatly increased.

To this fact attention is particularly directed.

In examining under the microscope a section of human tonsil, we find that, in common with the rest of the buccal cavity, its surface is invested with a thick covering of pavement epithelium, which rests upon a delicate endothelioid basement membrane. Following this is a tolerably compact

mucosa, formed of interlacing bands of connective tissue, and containing many connective-tissue corpuscles. Occasionally, the adenoid tissue extends so near to the surface of the organ that it penetrates the mucosa, and, here and there, actually encroaches upon the epithelial layers. In the walls of the crypts this encroachment is especially marked, the more plainly so as the bottom of the lacuna is approached. In other words, the epithelial and subepithelial layers, thick at the periphery, become rapidly more delicate the deeper we trace them down the crypt wall, until, toward the lowest depth of the lacuna, they generally disappear, by reason probably of the attenuation of the mucous membrane in this locality, and its consequent liability to rapid post-mortem decomposition and to mechanical injury in the preparation of the microscopical section.

This unusual destructibility is another point worthy of attention, for it, together with the point before mentioned, namely, the increase in the superficial extent of the tonsil caused by the crypts, constitutes a factor of the greatest importance in the pathology and the treatment of diseased conditions of the gland.

First, in its pathology, it is evident that any morbid condition which may affect the surface of the tonsil will also, in all probability, extend into the crypts, and thus add greatly to the amount of irritation apparently present in a given case. Moreover, the delicate nature of the lining of the crypt wall would facilitate the absorption of matters retained in the crypt, and this, together with the intimate connection of the tonsil with the lymphatic system would, manifestly, expose the patient to the danger of general infection in conditions attended with the presence of local sepsis, as, for instance, in diphtheria, and in inflammatory affections giving rise to purulent discharge.

The effect of irritation of the lacuna upon the whole tonsil is a matter of common observation in cases where it has been distended by cheesy accumulations, by tonsillar calculi, or by retained pus.

The writer has recently seen a case in which the latter

condition was unquestionably accountable for a well-marked swelling and tenderness of the cervical lymphatics, and a similar case has been reported to him by Dr. Albert H. Buck; while in diphtheria the same symptom is so common as almost to be pathognomonic.

Turning now to the consideration of the matter of treatment, however, these very anatomical conditions before mentioned offer possibilities for the relief of disease which have, by the majority of practitioners, but rarely been appreciated or utilized. Instead of merely painting the medicament over the well-protected surface of the tonsil, let it be applied thoroughly to the delicate wall of the interior of the crypt. Then, not only will a far greater extent of surface be reached, but, also, the effect upon the gland will be much more profound, from the greater ease with which the application will be absorbed.

The objection may be urged, that to make such an application to the tonsil of a child, or even to an adult tonsil of normal size, would be impracticable. It should be remembered, however, that morbid conditions of the tonsil are almost invariably accompanied by hypertrophy, and that the larger the tonsil the larger will be the crypts; and this, together with the insensitiveness of the organ, which exists in many instances, will render the operation easier than might be supposed. By this plan three general varieties of treatment may be employed, namely: the disinfectant, the astringent, and the cauterant. The lacuna should first be cleansed by means of a bit of absorbent cotton upon a fine probe, or by a stream of water from a curved syringe, and the application then made by an appliance similar to the one used for cleansing.

My friend, Dr. Lincoln, has for a long while advocated the use, in this manner, of a strong solution of iodine and chloride of zinc, and he and others have also used nitrate of silver, fused upon the end of a probe. For this purpose the writer has found it exceedingly convenient to apply the fused nitrate to the end of a small splinter of wood. This can readily be grasped in any good forceps, and when once used it can be thrown away.

The measures here suggested can probably nowhere be so well utilized as in those troublesome cases of hypertrophy of the tonsil in which excision is for any reason impracticable. No stronger argument could be brought forward, however, in favor of excision of an hypertrophied tonsil than the anatomical points referred to in this article. The conditions in which the general measures referred to will be applicable, will suggest themselves so readily, that to enter into details concerning them seems unnecessary.

The President invited the attention of the Fellows to an exhibition of instruments immediately after adjournment.

The meeting then adjourned.

Afternoon Session.

The Association was again called to order by the President at 3 o'clock.

Paper.

THE VALUE OF POST-LARYNGEAL PAPILLOMATA AS A MEANS OF DIAGNOSIS IN TUBERCULAR DISEASE.

By GEORGE W. MAJOR, M.D.

IT is not without some hesitation that the subject of this paper is introduced. An honest conviction, however, of the value of post-laryngeal papillomata as an aid in the diagnosis of tubercular disease, and the possible production of some good result, have induced me to make known the conclusions arrived at as the outcome of extended observation. There will be no effort to destroy or to underestimate any of the time-honored laryngeal indications, but on the contrary to increase our store by the addition of what may at first seem as of but trifling importance. In speaking of papillomatous growths of the posterior laryngeal wall, reference shall be made to developments of two kinds, or, more correctly, two degrees of the same kind; and for convenience and accuracy, a division into—1st stage, velvety, and the 2d stage, filamentous or feathery, suggests itself. Of the accuracy of the above arrangement there does not appear to be much doubt.

The region in which these excrescences exist, to be of diagnostic value, is not extensive, and may be laid down as the area bounded below by the the posterior margin of the floor of the larynx, above by the interarytenoid space, usually its anterior margin, and laterally by perpendicular lines let fall from above downward on the posterior insertion of the vocal bands when in full inspiration. These growths have been noticed in some special works on laryngeal phthisis, but in so far only as concerns their occasional presence; their value as a means of diagnosis or prognosis seems, in so far as could be ascertained, to have been overlooked. These conditions are not always present, but when they do occur there is usually, if not universally, an absence of the generally accepted laryngeal signs, if we exclude pallor and excessive secretion. The explanation of the *raison d' être* is not here attempted. Whether any relation exists between this morbid process and the early impairment of the action of the arytenoideus muscle, is a matter open for discussion. Its propinquity might suggest this point. Be that as it may, the clinical fact is what most concerns us. A very brief reference to a few cases will best serve our purposes of illustration.

Case 1.—J. T. H., an Englishman, a night editor, æt. thirty-four, referred by a medical friend for a laryngoscopic examination in 1879. This patient was subject for several weeks to an irritating cough, which refused to submit to sedative treatment. On examination, filamentous growths were found in the region specified. Absorbent cotton on a holder was used, and removed the greater number. The cough showed improvement. Astringent sprays were ordered, and some benefit ensued. Six weeks later cerebral symptoms developed, and after an illness of three weeks the patient succumbed. P. M.: General tuberculosis.

This case had suffered a year previously from pneumonia of right side, and cheesy degeneration was suspected by his medical attendant.

Cases 2 and 3.—M. A. M. and A. M., two sisters, aged respectively thirty-two and twenty-one years, sought advice for aphonia, much about the same time. A "velvety" condition was observed

and deficient action of the arytenoideus. No signs of pulmonary engorgement. The "velvety" growths became "filamentous" in the course of a few weeks, and subsequently ulcerated; the voice returning, without any local treatment, in each case and the ulcerations healing. Signs of deposit were manifest about the time of the growths becoming feathery, and softening shortly after.

CASE 4.—J. R. M., æt. forty-two; a chronic dyspeptic for six years. Mother died of consumption. First seen, March, 1882. Did not complain of any symptom referable to the chest; a slight cough; a velvety condition of post-laryngeal space. Ordered sol. hyperphosphites of lime and soda. Gave patient a cautious opinion; urged him to spend the summer in the Adirondack region. Three weeks later had a pulmonary hemorrhage. Did not again present himself until December, 1882; meantime, had been to a Pennsylvania health resort, and had gradually become reduced. On examining lungs, tubercular signs were marked, and were general. The larynx was attenuated-looking, pallid; and filamentous growths, at least one-sixth to one-twelfth inch in length and eight or ten in number, were visible. Subsequent disappearance of the same. Softening, and death in February of this year.

CASE 5.—Wm. H., æt. thirty-four, a book-keeper, had been under treatment for deafness and post-nasal complications before showing himself. On examination in May, 1882: Filamentous growths; no swelling; pallor of larynx. Lungs showed apex dulness. Improved at first. Lost sight of until August of same year, when he returned from the sea, whither he had gone in violation of expressed opinion. Larynx now was wasted. No growth nor ulceration visible. Lungs advanced in softening. Difficult deglutition. Ulceration of pharyngeal wall and tongue, and fatal termination the same month.

All these cases were fatal. There might be at least a dozen more of just such cases, and of which the histories are available, were it necessary. The foregoing are average typical ones, and will suit our purpose and not overburden patience and forbearance.

Of cases still living in fairly good health many are under observation in which progress has not gone beyond the "velvety" stage. These cases have received supporting treatment, topical astringents, and removal to suitable climates, and are doing well; it will not be necessary to detail

them. The class now to which reference is had, it may be said without exception, are of tuberculous history, hold their ground well throughout our dry, cold, and bracing winters, but toward the end of February and during March, April, and May show signs of return of local trouble, and require removal to South Carolina, where they generally thrive during our inclement weather. In the summer the Adirondacks give most admirable results, and they seem to lay up a store of health to last until the beginning of the following year. Of all local treatment, solution of chloride of zinc, x or xv grains to the ounce, answers best.

The conclusions arrived at are much as follows:

I. Velvety papillomata of the post-laryngeal wall occur far more frequently in persons of well-defined tubercular history than in those who do not show hereditary tendency.

II. They occur, as a rule, before there are any local lung signs of deposit, but the general health is usually at a low ebb.

III. They may be looked upon as the first stage of the thread-like, filamentous, or feathery variety.

IV. They are often amenable to local and constitutional treatment.

V. The feathery form is generally synchronous with tubercular lung deposit, and disappears, in so far as can be made out, with lung softening.

VI. The class of larynx in which these growths occur is usually, if not always, free from the usual signs of laryngeal tuberculosis, or more safely it may be said, free from the indications that pass for that condition. As a rule, there are attenuation and a generally wasted or dissected-out appearance, a freedom from swelling of arytenoids and ventricular bands, and a general paleness of the surface, bathed with an abundant secretion.

The clinical facts are given for what they are worth; personally we regard the indications as most valuable for diagnostic purposes. It is not possible to estimate the frequency with which these growths occur, as but a small proportion of such cases come under the observation of laryngologists, and when seen, the disease has so far advanced that the

state of affairs under consideration has passed away. In the clinic at the Montreal General Hospital all cases of suspicious nature have been carefully followed for the past four years, and it is not too much to say that the value of the indications here suggested have proved eminently satisfactory, when they are present, for purposes of diagnosis, and as eminently unsatisfactory as to prognosis.

Discussion on Dr. Major's Paper.

Dr. ASCH remarked that he had frequently observed in phthisical cases the inter-arytenoid projections described by Dr. Major, but that he had not considered them diagnostic of pulmonary disease, as he had observed them in cases of asthma and in others in whom there was no tubercular complication. His treatment in cases where the projections did not demand evulsion by the forceps consisted in the application of astringents as described by Dr. Major.

Dr. MAJOR said in reply to Dr. Asch that in the "velvety" condition of the space under discussion he had not usually found lung complication, but such cases were hereditarily tuberculous. After the filamentous stage he had yet to see a case recover, and he considered where that state had developed, that the prognosis was markedly unfavorable.

Paper.

A CASE OF GLOSSO-EPIGLOTTIC MYXO-SARCOMA; AND A BIBLIOGRAPHY OF PHARYNGEAL TUMORS.

BY ETHELBERT CARROLL MORGAN, A.B., M.D.,
WASHINGTON, D.C.

IN calling attention to the present instance of what may be denominated a laryngo-pharyngeal tumor, I have two motives: first, to record an interesting variety of neoplasm; and second, to describe the method followed for its removal, which, to say the least, was primitive.

Accurate drawings are herewith presented of two other pharyngeal tumors which have come under my observation, being the cases operated upon at the Providence Hospital, by my friend, Prof. Johnson Eliot, M.D.*

* The tumor and life-sized drawings of the writer's case were also presented to the Association.

In connection with the present undertaking my desire was to tabulate all reported cases of pharyngeal or laryngo-pharyngeal tumors, with reference to their nature, dimensions, seat, symptoms, treatment, and recurrence.

I find, however, that these morbid growths have frequently been vaguely named, and oftener no reliable microscopic data were obtainable.

Compelled, then, to limit myself to recording the most instructive and complete of these reports, I append what, with my present knowledge, may be regarded as the most complete bibliography on this subject extant.

The preparation of this bibliography has been laborious, and my thanks are expressed to Drs. Billings and Fletcher, of the library of the Surgeon-General's Office, Washington, D. C., for valuable assistance.

The following is a concise history of my case, corrected up to the date when he was last examined by me, May 15, 1883 :—

Mr. John C———, aged forty-nine, had complained for the past eighteen months of cough, dysphagia, dysphonia, and occasionally of complete aphonia. The above symptoms were increasing from week to week, and being associated with suffocative attacks at night, on several occasions nearly resulted fatally. He experienced a constant inclination to swallow, had no real pain, and reclining in some positions was absolutely impossible. The man was strongly and compactly built, had a well-developed chest, and gave no history of syphilis, though there was slight enlargement of the cervical lymphatics at the left angle of the inferior maxilla.

Direct examination revealed the presence of an enormous growth springing from below, and occupying nearly the entire oro-pharynx.

Laryngoscopic examination was difficult on account of the extent of the tumor, but showed that it was pedunculated and attached by a broad base in the left glosso-epiglottic fossa, and to a small portion of the lateral pharyngeal wall.

Further digital exploration confirmed the above, and I found that the pedicle of the growth could be included beween the tips of the index and middle fingers, so that an écraseur could readily have been employed in its extraction.

I could not, however, resist the inclination to operate at once. Telling my patient to remain seated, I inserted the index and middle fingers, seized the pedicle, and, using considerable torsion and force, removed the tumor.

My assistant, Dr. G. Byrd Harrison, tells me that there was only slight hemorrhage, and subsequent odynphagia, and that the patient spoke in a clear unobstructed voice immediately after the operation.

The tumor measured two and one fourth inches in its lesser, and two and three fourths in its greater, circumference ; it was of firm consistence and ovoid shape, having a pedicle one-fourth inch long. Laryngoscopic examination, practised after the extraction, showed that the left ventricular band was implicated, and that a large nodule occupied the anterior portion of the right arytenoid region.

My after-treatment comprised the employment of a sedative gargarism and spray. The patient, at this date, is doing remarkably well.

The microscopic examination and drawings of the tumor in my case, which are herewith submitted, were executed by Dr. J. C. McConnell, of the Army Medical Museum, Washington, D. C.

His report reads as follows :

"ARMY MEDICAL MUSEUM,

"WASHINGTON, D. C., *May* 10, 1883.

"MY DEAR DR. MORGAN :

"Microscopically, the tumor presents the characters of a myxo-sarcoma. It is very vascular ; so vascular that it might properly be called myxo-sarcoma telangiectodes. The epithelial covering is that of the region in which the tumor had its origin ; it is sharply defined, and in no portion of the growth has it burrowed. The stroma in diffused areas, particularly just beneath the epithelial covering, has undergone a mucoid change. In all other situations the tumor presents the ordinary appearances of a spindle-celled sarcoma. The vessels have in large numbers undergone amyloid degeneration of their walls.

"Very respectfully,

"Your obedient servant,

"J. C. MCCONNELL, M.D."

ABSTRACT OF DR. ELIOT'S CASES.

I.

"Some nine years ago I was requested by Prof. Robert Reyburn to see Captain B., aged 29. The Captain's history was excellent; he had never suffered from constitutional disease of any description, was physically well developed, and presented a specimen of perfect health.

"Upon examination the right tonsil was found enlarged, with a tumor occupying one-fifth of the hard palate; the palatine swelling was smooth, symmetrical, with the mucous covering apparently thickened; there was also congestion of the surrounding tissues. The tumor was painless, firm, but slightly resilient on pressure. We came to the conclusion that it was either fibrous or cartilaginous. There was no glandular implication in the cervical or submaxillary regions. He informed us that the tumor had grown slowly; it had not as yet interfered with respiration or deglutition. He sought relief, and expressed a willingness to have it removed, insisting on the administration of ether. We reluctantly acceded to his wishes. A few inspirations of the anæsthetic satisfied us of the danger attending its administration; it was immediately withdrawn. A second attempt to etherize him was made, but discontinued at the approach of asphyxia. After the removal of a small portion of the tumor the case was abandoned, he refusing to submit to the operation without anæsthetics, which we declined to administer.

"Early in December last he placed himself under the charge of Dr. Ralph Walsh of our city, and by that gentleman I was invited to see him. Dr. Reyburn was added to the consultation. We found the patient in a truly deplorable condition. The tumor had extended over three-fourths of the hard palate, the uvula and half arches were forced back and obscured from view, the tongue was depressed, with scarcely space to pass the finger between that organ and the tumor. The corresponding sides of the face and neck were enlarged by the external protrusion of the tumor. The connection of the growth between the palatine and submaxillary region was readily diagnosed; pressure on the palatine aspect increased the fulness in the submaxillary region. His respiration was so embarrassed and stridulous that it was painful to be in his company. The recumbent position was painful and suffocating. His countenance livid, articulation indistinct, mastication painful, and deglutition difficult. He informed me that within the last

month the tumor had increased rapidly ; he could almost mark its daily growth. He was despondent, anxious, and apprehensive of the result ; he felt a cord daily tightening around his neck, that must eventually suffocate him. His affliction was so terrible that life had ceased to be a boon. He was now willing to submit to surgical interference.

"On the 3d of January, 1879, assisted by Prof. J. Ford Thompson, of the hospital staff, Profs. Reyburn, Ashford, and Walsh, a semilunar incision was made on the posterior margin of the hard palate, another was made on its anterior portion, connecting the latter with the first, leaving an ellipse of two inches in width. The circumscribed part was seized with a strong vulsellum, and traction made. The dissection was necessarily slow from frequent interruption by the patient freeing his mouth and throat from blood. An hour elapsed before the cervical portion of the tumor was raised from its bed. The hemorrhage was considerable. No vessels were tied ; no hæmostatic used ; the bleeding ceased on the completion of the operation ; the mass was removed in detached pieces.

"Upon superficial examination it appeared to be sarcomatous in character. A portion of it was preserved for microscopic examination, but by some accident was mislaid."

I would say that the above case has been recently examined by me, and there are no evidences of a recurrence of the growth, the patient being in perfect health.

II.

"In the summer of 1880, Miss F. V., aged twenty-three, white, was brought to the Providence Hospital for examination. Her general appearance indicated impaired health, she being anæmic, feeble, and emaciated. Examination revealed a tumor the size of an English walnut, situated upon the left side of the velum pendulum palati, extending to the pharynx and tonsil of the same side. Her voice was husky, deglutition painful, and respiration slightly embarrassed. The lymphatics of the left side were enlarged and sensitive. The tumor was elastic on pressure, painful to the touch, and several deeply ulcerated points were noticed on its surface. As the growth was regarded malignant, surgical interference was not deemed advisable, and she was counselled to go home.

"In November, 1881, one year after her first examination, she

again entered the hospital. The tumor was larger, respiration difficult, and it was impossible to close the mouth. Finding the ulcerations cicatrized, the surface smooth, the lymphatic glands less swollen, and her general condition improved, it was deemed advisable to operate. On November 22, 1882, in the presence of Drs. E. C. Morgan, Ashford, Magruder, Bayne, and Mallan, the operation was performed. The patient was seated in a chair. No anæsthetics were employed. We anticipated great hemorrhage, and had the thermo-cautery, hæmostatics, and tracheotomy tubes at hand.

"An incision was made in the long diameter of the tumor, and its contents rapidly enucleated, several small pieces of bone coming away with it. Little hemorrhage followed, no hæmostatics were required, and bleeding ceased with the conclusion of the operation. On the second day hemorrhage occurred, but was quickly controlled. The patient convalesced slowly, and after several weeks left the hospital.

"On March 12th she returned with a small swelling at the side of the cicatrix, and was anxious to have it removed. On the day fixed for the operation, while conversing with a patient in the ward, without premonition, violent hemorrhage took place, and death followed immediately.

"No autopsy was made. A large vessel had evidently been opened by the softening of the tissue and had yielded to arterial pressure. Microscopic examination demonstrated the tumor to be a spindle-celled sarcoma."

REMARKS.

It is generally believed and stated by authors that pharyngeal growths are rare, and that few cases have been recorded.

Patient investigation has convinced me beyond a doubt of the incorrectness of the above statement, for in working upon this paper I have succeeded in collecting at least one hundred and thirty examples, sixty-one well authenticated, embracing a period of seventy-one years, extending from 1812[1] to 1883, inclusive.

I desire to especially explain that my statistics deal solely with tumors originating in, or tumors extending into, the inferior pharynx, having purposely omitted all

[1] Winter, A., *Chiron. Sulzbach.*, 1812–'13, iii, 315–331, pl. 1.

reference to the exhaustive tables of Cervesato[1] and Moure[2] on cystic tumors of the epiglottis.

Sarcoma is the most common growth occurring in the pharynx, fibroma being next in frequency.

The following tabular statement shows in detail the relative frequency of the different morbid growths among the sixty-one cases specially examined:

Sarcomata	14
Fibromata	10
Fibro-sarcomata	1
Myxo-sarcomata	4
Albuminous-sarcomata	2
Lipomata	3
Papillomata	3
Lymphomata	5
Osteomata	1
Fibro-plastic tumors	1
Dermoid tumors	3
Congenital tumors	1
Adenomata, cystic	1
Growth bearing pilose skin	1
Nature not mentioned, unknown, or doubtful	11
Total	61

It is my pleasant duty to say that an essay read before this Association at its first annual meeting by Dr. Frederick I. Knight,[3] as also the article of Dr. G. A. Peters,[4] present the subject-literature of pharyngeal tumors more satisfactorily than any English papers with which I am acquainted. I shall not now undertake to describe Dr. Knight's interesting case—we are all familiar with it. The four cases reported by Peters were myxo-sarcomata; two of them were operated by himself, one by Dr. H. B. Sands, and one by Dr. M. J. Asch.

Arnott[5] gives rather an indefinite description of a pedun-

[1] *Lo Sperimentale*, January and February, 1881.

[2] *Rev. mens. de laryngol.*, etc., Nos. 4, 5, 1880, and Nos. 6, 7, 8, 9, 1881.

[3] TRANS. AM. LARYNGOL. ASSOC., 1879, p. 204.

[4] *Med. Rec.*, N. Y., 1880, xviii, p. 565–568.

[5] *Lond. Med. Gaz.*, N. S., 1845, vol. 1, p. 530.

culated tumor, the nature of which he does not mention, situated at the base of the tongue, on the pharyngeal wall, and being as large as a green walnut. He says, "the growth was ligated at its pedicle and twisted off." The natural inference from the text is that Arnott made use of his fingers in the twisting process, for no instrument is alluded to. As far as I can judge, the above case is the counterpart of the one reported by me to-day, being the sole example of a similar operative procedure to be found in the medical literature at my command.

Barton[1] reports a congenital growth, nature not stated, which he extracted from the pharynx of a woman by means of an écraseur and scissors.

Abraham[2] describes a rare growth, bearing pilose skin, of which he presents a drawing. After removal with écraseur there was no recurrence. Interesting cases of dermoid tumors are also recorded by Clinton Wagner,[3] Hale White,[4] and Kidd.[5]

Holt[6] reports a unique case of a "fatty pendulous tumor of the pharynx and larynx," which, on one occasion, during vomiting, protruded in such a manner as to occlude the larynx, and suffocation would have resulted had the tumor not been pushed aside. The patient died suddenly while smoking his pipe; and it is conjectured that the tobacco-fumes produced sudden cough and displacement of the growth, causing suffocation. On post-mortem examination of the pharynx, a large pendulous tumor was detected, filling the pharynx, and extending downward toward the œsophagus to the extent of nine inches.

Taylor[7] mentions his case of fatty tumor behind the pharynx, presenting all the evidences of a post-pharyngeal abscess; but which, on incision, proved to be a lipoma. Death resulted from suffocation, although tracheotomy was performed.

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[1] *Med. Press and Circ.*, Lond., 1881, N. S. xxxi., 10.

[2] *Jour. Anat. and Physiol.*, Lond., 1880–'81, xv., 244–248.

[3] *Med. Rec.*, N. Y., 1881, xx., 76.

[4] *Lancet*, Lond., April 9, 1881, p. 581.

[5] No reference given.

[6] *Trans. Pathol. Soc. of London*, 1853–'54, v., pp. 123–125, pl. 1.

[7] *Tr. Path. Soc.*, 1876–'77, Lond., 1877, xxviii., pp. 216-218.

Vidal[1] says that Vimont had a patient in whom a large pharyngeal tumor was detached and ejected during vomiting.

Pedunculated sarcomata are, according to my researches, rare; the most instructive case has been recorded by Billroth.[2]

McLeod's[3] pharyngeal sarcoma was as large as an orange; laryngotomy was performed prior to its extraction, and the case was cured.

Having given the clinical history, mode of operation, termination, and microscopic data, of my own case, as also abstracts of Dr. Eliot's interesting operations—with one of which I was associated; and having briefly mentioned a few of the reports that have come under my notice, I wish simply to add that attention has been called to this tumor:

First, Because of the rarity of pedunculated myxo-sarcomata in this particular situation.

Second, Because of the size this tumor attained.

Third, To demonstrate that our *fingers* may sometimes effectually supplant instruments; and

Fourth, In order to ascertain what degree of urgent symptoms warrant operative interference in a pharyngeal neoplasm whose benign or malignant character is unknown.

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Discussion on Dr. Morgan's Paper.

Dr. DEBLOIS said that at least one useful suggestion might be drawn from the very interesting paper of Dr. Morgan, and that was the proper use of our fingers.

As our practice in laryngology becomes more and more scientific, so much the more are we addicted to the use of instruments, to the exclusion of more natural means. In this connection he would suggest the propriety of the use of the finger-nail in the extirpation of growths in the larynx. He had the good fortune to partially remove, in this way, a growth from the vocal cord, where, owing to the hyperæsthesia of the parts, the introduction of the laryngeal forceps was impossible.

Although this procedure may seem brutal, it appeared to him at least quite as justifiable as introducing the forceps at random when the parts cannot be seen.

With regard to the bibliography of the subject, he thought that the Association owed its thanks to Dr. Morgan, the result of whose extensive and laborious researches had just been presented.

Dr. INGALS referred to a case of a very large growth in the nasopharynx, extending into the mouth, which greatly obstructed breathing, and which was operated upon by Dr. Moses Gunn, of Chicago, who removed it with his finger. He had not been able subsequently to discover the point of attachment of the tumor. With regard to the brutality of attempting to remove laryngeal growths with the finger, he would merely state that it would depend upon the size of the operator's finger.

Dr. DELAVAN said that he recalled one of the cases referred to in the paper by Dr. Morgan; he had been present when the operation for its removal was performed by Dr. Wagner; it was in a girl of twenty-two years of age, who had not been aware of any difficulty in her throat until a few weeks before applying for treatment. Upon examination a growth one and a quarter inches long by three fourths of an inch wide was seen depending from the posterior border of the soft palate. It was found to be attached near the floor of the posterior nares on the left side. Schrötter's écraseur was used, but it was impossible to remove it in this way, and it was finally divided with great difficulty by means of a strong knife. Upon microscopic examination the outer surface was found to be covered with a thick coating of epithelium, having a horny

layer and a basement membrane, and under this a thick layer of fat. In the centre of the tumor was a large double plate of true cartilage, surrounded by a fibrous sheath or perichondrium. The point of interest in the case was that the patient had been unconscious of any difficulty in her throat until within a short time, although the growth was evidently congenital. It resembled the helix of a normal ear. He had, at the time, reported the case at a meeting of the New York Pathological Society, and had found that up to that time at least six cases had been placed upon record. As to the removal of morbid growths in this locality with the finger, he thought the method particularly applicable in cases of adenoma at the vault of the pharynx. It seemed illogical to examine such a case with the finger, and then resort for its removal to an instrument, when the examination and the removal might be combined in one manipulation. He thought the use of the finger-nail, in certain favorable cases, even superior to the use of instruments.

Dr. LINCOLN said that, in order to illustrate the possibility of operating with the fingers through the mouth upon tumors of large size, he was prompted to add that in his researches upon the treatment of naso-pharyngeal tumors, in the paper which he had read the day before, he found a report of a case of naso-pharyngeal polypus removed by Dr. Whitehead by the fingers, unaided, if he remembered correctly, by instruments.

Dr. ASCH said that he would merely suggest that difficulty is experienced in introducing the finger behind the palate in many cases, especially in women. There are, unquestionably, cases in which such a method could be applied, but in others it could not be carried out without producing severe laceration.

Dr. BOSWORTH said that Meyer reports some three hundred cases of examination and diagnosis of the naso-pharynx with the finger.

Dr. MORGAN said that, in resorting to an operative procedure essentially pre-laryngoscopic in character, he had placed himself beyond the pale of this Association of Laryngologists.

The relief afforded his patient, the completeness of the extirpation, and the failure of recurrence to this date, all appeared to sustain the wisdom of the method. As stated, the statistics given deal with tumors of the inferior pharynx alone; hence the example of naso-pharyngeal growth mentioned by Dr. Lincoln was not included.

Paper.

A CASE OF SUDDEN DEATH, OCCURRING AFTER TRACHEOTOMY.

By MORRIS J. ASCH, M.D.

R. S., æt. forty-four, saloon-keeper, was referred to me in April, 1882, by Dr. Mayer, Assistant Surgeon in the Throat Department of the New York Eye and Ear Infirmary. The patient had been suffering for a year with hoarseness and a difficulty of breathing, gradually increasing, until at the time of his presenting himself, he experienced attacks of suffocation on the slightest physical exertion. There was but slight cough. He had had no hæmoptysis or night-sweats, nor did he complain of any pulmonary trouble, referring his hoarseness and the extreme dyspnœa for which he sought relief entirely to local causes. His respiration was embarrassed to such a degree, that the spasm of the chest-walls, caused by his efforts to breathe, rendered any examination of his lung extremely unsatisfactory. Examination of the larynx revealed an almost complete paralysis of the abductors of the larynx, the rima glottidis being almost completely closed; the ary-epiglottic folds were considerably infiltrated, and the ventricular bands and vocal cords ulcerated. The appearance of the larynx left no doubt as to the condition of the lungs, and whatever might be the immediate cause of the paralysis, there was no question but that tracheotomy was the only recourse against death by suffocation.

The patient was so advised, and, he consenting, the operation was performed April 25th, at the Eye and Ear Infirmary. There was some hemorrhage, which delayed the introduction of the canula, but the relief was complete, and the patient expressed himself as delighted with the result. He was placed in a small ward by himself, and all the precautions usual after tracheotomy were observed. For two days the progress of the case was satisfactory. There was no elevation of temperature, nor any other signs of disturbance. On the morning of the 27th, the pulse was found to be intermittent by the house surgeon, who reported the fact to me on my visit to the infirmary, at 2.30 P.M. I visited the patient at once, accompanied by the house surgeon and Drs. Mayer and Busche, my assistants. His pulse and general condition appeared normal, and he expressed himself as feeling very well. A moment after, Dr. Mayer examined him and found no pulse. Beads of

perspiration stood out on his forehead. The patient had fainted ; in a moment he recovered, said that he had felt faint, but was now all right. Stimulants were administered, and before leaving the ward he apparently had quite recovered.

He asked me not to give him whiskey, saying that Germans did not like spirits, and asked permission to have some wine brought by his sister who was in waiting on him. I assented, and proceeded to my other duties in the Infirmary. In a very few minutes the nurse summoned me hastily. I proceeded at once to the ward and found my patient cold and pulseless. Stimulating hypodermics were instantly given, and artificial respiration and Faradization resorted to, but to no avail,—life was extinct. The nurse reported that on my leaving the ward, the patient had called to him and said that he must be very sick to have so many doctors visit him, and that he was sure that he was going to die, and before the nurse could reassure him, was dead.

The autopsy was made twenty-four hours after death.

The body was not emaciated. There were scars on both shins of a suspicious nature, though the patient, during life, had denied knowledge of any venereal disease. There were old pleuritic adhesions over the left lung, with consolidation at the apex. Firm pleuritic adhesions were found over the whole of the right lung with a consolidation about one and a half inches in diameter at the apex, with an apparent recent cavity in the centre of the lung. The heart was perfectly normal, both as to structure and condition, with a post-mortem clot in the right ventricle. Inspection of the larynx confirmed the examination with the mirror. The ary-epiglottic folds were thickened, and extensive ulceration, involving the vocal cords and ventricular bands, was found.

There was some tracheitis. The dura mater was firmly adherent to the skull, and there was a slight opaline deposit over the posterior surface of the brain. No abnormality in any other portion. The intestines were not examined. All the other organs were perfectly healthy.

I deem this case worthy of report to the Association that attention may be directed to the fact that the condition of the patient after tracheotomy for obstruction is a grave one, and that great care should be exercised to guard him against sudden emotion.

Cases die after tracheotomy in whom a post-mortem ex-

amination reveals no satisfactory reason, and it is probable that in these instances, causes that ordinarily would have been deemed trivial, may have operated to produce death. It apparently requires but little to kill in this condition. In some a slight congestion of the lung suffices. In others, œdema, meningitis, cerebral œdema, cardiac disease—any of these of very slight intensity—will produce death in these cases. But in my patient there was absolutely no apparent cause. I can only explain it as being due to mental emotion. Fright, caused in an ignorant person by the belief that his situation was desperate, produced such an effect that death resulted, probably by inhibition, a method by which, as Dr. Brown-Séquard has shown, it takes place without any apparent cause.

I would take this occasion to point out that tracheotomy is a more difficult operation to perform and more serious in its results than works on operative surgery teach. I never perform it without advising the family of the patient that though the immediate result may be satisfactory there is always danger of an unfortunate termination. While as to the operation itself, though the text-books make it a very simple affair, in point of fact it is the very reverse. Occasionally we meet with cases that are extremely easy of performance, but the majority, I speak of cases where the operation is performed for obstruction of the larynx, tax the nerve and skill of the operator to the utmost. I know of nothing more difficult and embarrassing than to operate on a child with a short fat neck, struggling for air, with the veins over the windpipe congested and distended to the utmost. More than once in order to give air as rapidly as possible, and to prevent the patient dying on the table, have I opened the trachea with only my finger-nail for a guide, up to the knuckle in a pit of blood.

Billroth, and all laryngologists will concede his nerve and skill, says that he knows of no operation more difficult, and he would blame no surgeon for declining it. He thinks that it is a matter of congratulation for the medical profession that so many physicians perform it. I believe, however, that many patients die of hemorrhage, and many

after the operation, in diphtheritic cases, from failure of the heart.

The period of the session and time does not permit me to enlarge upon the subject. I can only urge that the lesson to be learned from experience is, that no case of tracheotomy performed for obstruction caused by acute or chronic disease, however easy of performance should be viewed as any thing but a very serious affair, and that it is the wise part to be prepared for a sudden unfavorable result.

Paper.

ON ADHESION OF THE VELUM TO THE WALLS OF THE PHARYNX.

By ANDREW H. SMITH, M.D., of New York.

As one of the results of ulceration involving the soft palate, and at the same time including the adjacent pharyngeal walls, we are liable to have a more or less complete adhesion of these parts, shutting off more or less completely the naso-pharynx from the general pharyngeal cavity. The ulceration which brings about this result is almost invariably of syphilitic origin, and belongs to the late tertiary manifestations. The earlier tertiary forms, the gummata for example, which attack the soft palate, and so often cause perforation, seldom involve the pharyngeal walls, and for this reason do not afford the conditions necessary for adhesion. Hence we often see the soft palate badly damaged, and the uvula perhaps entirely destroyed, while the communication between the upper and lower pharynx remains scarcely if at all restricted; the tension of the velum, in fact, often making the opening more ample than before. But at a later period, averaging, according to Berkeley Hill, from two to four years after infection, ulceration of the posterior and lateral walls of the pharynx takes place, and involving the junction of the velum with the latter, the resulting cicatrization produces a coalescence first at the angle of junction and then progressively toward the median line, until in many cases the adhesion becomes complete. The process is analogous to that observed in cases

of burns between the fingers. It is well known that these accidents will almost certainly result in the adhesion of the adjacent surfaces, unless the utmost care is used to prevent it, and often even in spite of the most intelligent treatment to that end. Cicatrization may take place on each surface separately, but at the point where they join a small granulating space will remain and this will creep along each finger, destroying the newly formed cicatrix, while adhesion of the opposed raw surfaces will advance at a corresponding pace. This process will continue until the limit of the cicatrix on one finger or the other is reached when it will cease, the vitality of the normal skin opposing its further progress.

This is probably the way in which adhesion of the velum takes place in most cases, the process commencing on either side at the junction of the soft palate with the wall of the pharynx and advancing slowly toward the median line. But cases do occur in which complete adhesion is effected in a very brief period, and apparently at all points simultaneously. So far as I can judge this takes place only when there has been very little abridgment of the depth of the velum, permitting its lower edge to reach readily back to the posterior pharyngeal wall ; and when at the same time the movements of the palate are in a great degree suspended by infiltration and swelling. The co-existence of these two conditions renders possible a prolonged contact of the velum with the walls of the pharynx, and if both the opposing surfaces are denuded of epithelium, direct adhesion will result. The extent of the adhesion varies greatly in different cases, not only in a lateral direction but also vertically. Sometimes only a very small portion of the border is attached, at others the margin is fused throughout its whole extent with the opposing surface. Sometimes only the edge is adherent, in other cases the whole posterior surface of the velum, and the superior surface of the soft palate seem to be blended with the opposite wall. In these latter cases, which are the result of extensive ulceration and great loss of tissue, the roof of the mouth and the posterior wall of the pharynx seem to be continuous, the line of adhesion not being traceable in the confused mass of

cicatricial bands which represent the original structures. Sometimes these bands are in the form of irregular vertical digitations between which there may be one or more places in which the adhesion is incomplete, and where a probe may be passed through.

It may happen that, after complete adhesion has taken place through the healing process resulting from treatment, a fresh ulcerative action is set up, and the cicatricial tissue is swept away wholly or in part, detaching the velum again more or less completely. Such a case I am enabled to show you by the kindness of Dr. Asch.

The results of complete adhesion of the velum to the walls of the pharynx are very distressing to the patient. In addition to the inconveniences of mouth-breathing, are added those arising from inability to free the nasal passages of accumulated secretions. The annoyance from this source may amount almost to misery. But it is nearly certain to entail another affliction still more terrible, viz: deafness. A pocket is formed behind the posterior margin of the hard palate, in which the secretions accumulate and become fetid, and in this foul pool the internal extremities of the Eustachian tubes are immersed, whenever the patient assumes the recumbent posture. Inflammation of the middle ear almost necessarily results. As the difficulties of treatment are immensely increased by the greater difficulty of access, the hearing is likely to be very much impaired or entirely lost.

In cases of complete adhesion the sense of smell is always absent, owing to the lack of the current of air through the nasal passages, necessary to bring the odoriferous particles into contact with the olfactory surfaces. The sense of taste, also, which is so dependent upon that of smell, is lost or greatly impaired.

The voice has a peculiar character. It differs from that which belongs to obstruction of the nostrils, as it lacks even the small measure of resonance which the naso-pharynx affords. It is an exaggeration of the quality of voice observed when the naso-pharynx is obstructed by adenoid vegetations or by a polypus.

The treatment of this condition consists in efforts to re-establish more or less perfectly the communication between the upper and the lower pharynx. If there is any opening whatever, even barely sufficient to admit a probe, the attempt should be made to dilate this by means of sounds or of laminaria or tupelo tents. In a case under my care, some years ago, an opening less than a line in diameter was ultimately so far dilated that a bougie No. 12 (English scale) could be passed by the patient, and the size of the aperture was maintained in that way. It does not require a very ample space in order to relieve in a marked degree the discomfort of the patient. The secretions will drain away through a very moderate opening, and thus the chief cause of deafness will be removed. In like manner a very limited circulation of air through the nose will restore the sense of smell and with it the sense of taste.

If this degree of relief can be secured by dilatation, it will only be necessary to provide for the patient afterward a suitable bougie, and instruct him to introduce it daily. Neglecting its use, even for a few days only, will occasion a loss of some of the advantage gained.

In searching for a possible minute opening among the irregularities of the cicatricial mass at the back of the throat, aid may be had from inflating the nose with a Politzer bag and watching for the passage of bubbles of air into the pharynx.

When there is no opening, or when sufficient dilatation is impracticable, a cutting operation becomes necessary. In performing this, it is well to pass a curved sound through the nostril and turning the point downward to cut upon it from the pharynx. An opening once made, it is easy to enlarge it by lateral incisions. But the difficulty is to keep this opening from closing. A great many devices have been resorted to to effect this, and have been in some degree successful. They all start from the idea of interposing a mechanical resistance to the tendency to re-adhesion of the divided surfaces. Champonier employed a flattened silver tube, which he introduced into the wound, and which was retained in its position by light clamps em-

bracing the last molar teeth on the upper jaw. This did fairly well, but it permitted the regurgitation of liquids and even of solids through the nose. A temporary expedient to be employed immediately after the operation is the use of a band of india-rubber passed through each nostril by means of a Bellocq's canula, and placed in the corresponding angle of the wound, the end being brought out of the mouth and united with the other extremity. The tension should be just sufficient to secure fixity of position. At the end of two or three weeks the healing will be so far advanced that a permanent apparatus may be adjusted, or the daily use of a bougie may be begun.

Kuhn has obtained a very good result by means of a plate of gutta-percha suspended in the pharynx from two wires passing through the nares. The plate extends above and below the line of incision, and effectually prevents re-adhesion. It requires to be worn permanently, or, at least, for a long period. This apparatus has the advantage over that of Champonier, that it permits approximate closure of the opening during deglutition, and thus avoids regurgitation by the nose.

Some two years ago I called the attention of the profession to a peculiarity in the caustic action of monochloracetic acid, viz., that the eschar remains attached until cicatrization has taken place beneath it. Dr. Delavan has made a very ingenious application of this observation in a case of adherent velum which, by his kind permission, I am enabled to show to you to day. In this case the uvula was firmly united to the pharyngeal wall, as was also a considerable portion of the velum on each side. In fact, there was adhesion along the whole of the margin of the soft palate except at two points,—one on either side of the uvula. The adhesion between these points was divided with curved scissors, and the raw surfaces were freely cauterized with monochloracetic acid. *Although they remained in contact afterward, no adhesion took place* and the operation has proved a permanent success. That this is due to the use of the acid does not, I think, admit of doubt.

The effect is to interpose two layers of firmly adherent

devitalized tissue between the healing surfaces, thus preventing their adhesion to each other more perfectly than could be effected by the use of charpie, india-rubber bands, gutta-percha plates, etc.

Should the results in other cases correspond with this, it will constitute a new era in the treatment, not only of adhesion of the velum, but also of injuries between the fingers, at the angle of the mouth, at the junction of the lobe of the ear with the face, etc.

Much can be done to prevent the occurrence of adhesions during the healing of ulcers in the pharynx by the diligent use of astringent applications, and the daily or more frequent separation of surfaces threatening to adhere. The plan suggested by Dr. Delavan would probably have also a prophylactic value.

Discussion on Dr. Smith's Paper.

Dr. DeBlois said it was his good fortune last winter to have under his care a patient with adhesion of the velum to the posterior wall of the pharynx ; such a condition as had been described by Dr. Smith. The nasal cavities were easily cleansed by filling them with Dobell's solution, and then, by forcing into one nostril a column of compressed air, the solution and the retained secretions were driven out through the other. Every day a small throat mirror was forced up behind the uvula, and there is no doubt that an opening would have been made had it not been that there was a superficial perforation, the edges of which were so closely adherent that nothing could be forced between them ; small bubbles of air only could be forced out behind the velum. Unfortunately, just as an operative procedure was determined upon the patient was lost sight of.

Dr. Delavan's suggestion for preventing this adhesion of the newly cut surfaces certainly appeared to him very valuable, and he hoped to be able to give it a trial.

Dr. Ingals said that about two years ago he had two little patients brought to him, the one seven the other nine years of age. In the younger one there was complete adhesion of the velum to the posterior wall, excepting a small opening about a line in length. In the older one a similar condition existed, but the opening was a little larger. The mother stated that this condition

had followed an attack of diphtheria. The children had been under treatment by another physician for deafness. Upon examination he found the nasal passages free. He inquired what could be done with such patients, and whether an operation could be performed under an anæsthetic with perfect safety?

Dr. SMITH said, in closing the discussion, that it appeared to him that the operation could be performed in these young subjects, but he doubted whether the advantages of an operation would be commensurate with its difficulties. He believed that it would be better to wait until the children had grown somewhat and become more manageable. He did not see any especial difficulty in the administration of anæsthetics in these cases.

The President announced that the last scientific paper on the programme had been read, making in all twenty-one to which the Fellows had listened at the present Congress.

The nominations for Officers of the Association for the coming year, as presented by the Nominating Committee, were read.

On motion the Secretary was authorized to cast the ballot for the Association, and the President declared that the following were unanimously elected:

OFFICERS FOR 1883–4.

F. H. BOSWORTH, M.D., of New York, President.

S. W. LANGMAID, M.D., of Boston, and S. JOHNSTON, M.D., of Baltimore, Vice-Presidents.

D. BRYSON DELAVAN, M.D., of New York, Secretary and Treasurer.

T. R. FRENCH, M.D., of Brooklyn, Librarian.

BEVERLEY ROBINSON, M.D., of New York, Member of Council.

On motion, the recommendation of the Committee, that the next Congress of the Association shall be held in New York City on the third Monday in May, 1884, was adopted.

The chair appointed the retiring Vice-Presidents a Committee to conduct the newly elected President to his seat.

Dr. LEFFERTS on leaving the chair congratulated Dr. Bosworth upon his accession to the dignity and honors of the Presidential office, and also congratulated the Fellows of the Association upon their choice of a presiding officer for the coming year. In turning over to his successor the office, after a year's service upon which he could look with feelings of honor and pride, he did so

with wishes for the continued prosperity of the Association, which was now in the best condition in which it had ever been, after one of the best meetings which it had ever held. He concluded with the cordial wish that the prosperty of the Association might continue during the coming year.

The President, Dr. Bosworth, invited the Vice-Presidents to take their seats, and introduced them to the Association. He said that he could only express his cordial acknowledgment to the gentlemen of the Association for the high honor they had conferred upon him in calling him to occupy this office during the coming year. He said that we belonged to a profession which offers for work few rewards such as the world applauds, but he did not know that he could ever hope to receive a higher one than this. He felt that the Association was very largely indebted for its success to his predecessor, Dr. Lefferts, who had served them faithfully for five years as Secretary and Treasurer, and in the Presidential office. The best wish that he could express for the Association was that it might continue in as prosperous a condition as it was at present.

Dr. Ingals, on behalf of the visiting Fellows, returned thanks for the warm hospitality they had received, and expressed their high appreciation of the retiring President's services.

He also expressed regret that the trouble of entertaining the Association should have been again put upon its members in New York City, but the visiting Fellows would help to make them as light as possible, and he promised a larger attendance from the West next year.

The President then announced the Fifth Annual Congress of the American Laryngological Association adjourned.

D. Bryson Delavan, *Secretary.*

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American Laryngological Association
Transactions of the annual meeting

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